Utilization of Advanced Journeyman Training in the U. S. Naval Construction Force

by

Steven John McGrey, B.S.

Thesis

Presented to the Faculty of the Graduate School

of the University of Texas at Austin

in Partial Fulfillment

of the Requirements

for the Degree of

Master of Science in Engineering

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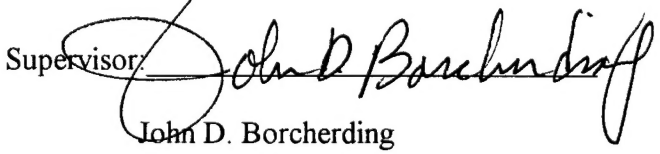
Supervisor: 

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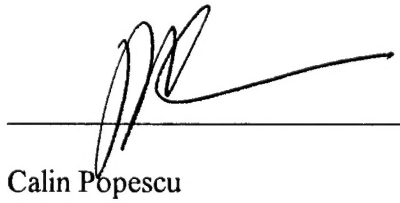

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Steven John McGrey, M.S.E

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The U.S. Naval Construction Force (NCF) in the U. S. Navy's internally controlled engineering and construction entity. Comprised of approximately 200 Civil Engineering Corps (CEC) Officers, 9,000 Enlisted Personnel, and 1,000 Civilian Personnel in support, the NCF is, by comparison, the equivalent of a fairly large civilian construction firm performing on the order of $100 plus million in construction work around the globe annually. A significant amount of funding and effort is expended upon internal construction craft training for the seven crafts inherent in the NCF structure. The general focus of this thesis will be on analyzing training effort expended relative to the actual employment and utilization of the skilled workforce currently present in the NCF. Specifically, the focus will be on First Class Petty Officers, the NCF equivalent of the civilian construction worker position of Foreman, and their training and utilization as applied in a Naval Mobile Construction Battalion (NMCB), the fundamental element of the Naval Construction Force.

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Glossary of Terminology

1. Bureau of Naval Personnel (BUPERS): The U. S. Navy Command responsible for personnel policy and administration and for the rotation and placement of individual servicemembers in specific job assignments.

2. Civil Engineering Corps (CEC): The internal branch of the U. S. Navy responsible for shore base facilities procurement, construction, maintenance, and repair. The CEC areas of responsibility are generally divided among Public Works, Construction Contracting, and the Naval Construction Force.

3. Detail/Detachment: A element of a Naval Mobile Construction Battalion (NMCB) assigned specific construction project work at a location independent and removed from the NMCB deployment location; generally numbering between ten and eighty personnel.

4. Detailing: The process of assigning individual personnel to a specific organization. Detailing generally occurs every three to four years and involves geographical relocation to a new Naval Command or place of work.

5. Deployment for Training (DFT): A military exercise designed to place thirty to sixty Naval Construction Force personnel in a remote environment in order to simulate independent construction operations in a contingency environment.

6. Enlisted Personnel Management Command (EPMAC): The U. S. Navy Command responsible for assignment of new recruits, monitoring NEC Skills held on an individual basis, and monitoring NEC Skill assignment numbers in all Naval Activities and Commands.

7. Forward Deployment: A seven month period in which a entire NMCB relocates to one of four overseas U. S. Naval bases to perform actual construction work for the host Naval Base. A deployment also generally involves several Details operating relatively independent of the NMCB at Naval Bases in geographic proximity.

8. Homeport: A seven month period in which a NMCB returns to the home Naval Base (Port Hueneme, CA or Gulfport, MS) to undergo construction craft related and military skills training.

9. Mainbody: The bulk of a NMCB that deploys to one of the four main deployment sites, performs construction project work, and provides support to the Details/Detachments operating away from the Mainbody.

10. Marine Engineering Force (MEF): The element of the U. S. Marines that performs construction related efforts necessary to allow a Marine attack to proceed. A NMCB is generally assigned to a MEF during a combat scenario and receives construction requirements and support from them.

11. Naval Facilities Engineering Command (NAVFAC): The parent command of all Civil Engineering Command (CEC) Officers and the organization that establishes operating policy and procedure for all Naval construction and facilities related issues.

12. Naval Construction Brigade (NCB): A primarily administrative Naval Organization responsible for assigning construction project effort to the NMCBs and monitoring safety, quality, equipment, and camp/facilities issues, among many others smaller in magnitude.

13. Naval Construction Force (NCF): A term used to identify all personnel directly involved in the U. S. Navy's internal construction capability.

14. Naval Construction Regiment (NCR): A primarily administrative Naval Organization reporting directly to a NCB and responsible for providing construction craft and military training, material procurement, and engineering support for the NMCBs.

15. Naval Construction Training Center (NCTC): A Naval Command with the mission of providing all levels of construction craft related training for members of the Naval Construction Force (NCF).

16. Navy Enlisted Classification (NEC): A numerical code assigned to an individual who has completed an advanced construction craft related technical school. NECs are then used for measurement of a NMCB's construction capability and for the purpose of job assignment of the individual.

17. Naval Mobile Construction Battalion (NMCB): The fundamental construction element in the Naval Construction Force, consisting of 615 personnel of varying construction crafts fully equipped and trained to perform construction work in a combat or contingency environment.

18. Rating: The particular trade or craft of a U.S. Navy enlisted member.

19. Rate: The particular paygrade of a U. S. Navy enlisted member, generally an indicator of time spent in service and seniority.

20. Special Construction Battalion Training (SCBT): A short, two to three week technical construction craft school conducted by a NCTC and oriented towards improving a craftsperson with a basic or fundamental skill level.

21. Tasking: The actual construction projects, or portions thereof, assigned by a NCB to a NMCB and associated Details for accomplishment during a forward deployment.

22. Theater: The geographic global area to which a NMCB is deployed

Chapter One

Introduction

1.1 Background: The U. S. Military services must maintain a significant construction capability as part of any offensive or defensive scenario. Construction of roads, bridges, camp facilities, piers, fuel depots, etc. has, and will continue to be, a required and essential function for any form of war effort to be effective. Although not fully employed in these functions during a peacetime environment, the Armed Forces must maintain well trained and well equipped troops should the need for such construction services ever arise. Therefore, a significant amount of peacetime activity and effort are dedicated toward training aimed at ensuring combat and construction skills readiness and preparedness.

The U.S. Naval Construction Force is the U.S. Navy's own internally controlled construction asset. The Naval Construction Force (NCF) was founded by Admiral Ben Morell in March of 1942 as World War II was moving into full effort and the U. S. Navy Civil Engineering Corps (CEC) recognized the need for an internal construction capability comprised of men who could both construct advance naval sea and air bases, as well as defend themselves during the construction process. The NCF distinguished itself during world War II primarily in the Pacific, where they became well known and appreciated for the construction of piers, airfields, fueling facilities, roads, camps, bases, water service facilities, barracks, buildings, utilities, bridges, defensive positions, and virtually every naval facility constructed during the march across the Pacific; often under combat conditions. The men of the NCF in World War II became known as "SeaBees", after the "C" and the "B" from the Construction Battalions in which they served.

1.2 Purpose: The purpose of this thesis is to study the overall construction craft training effort that is an everyday way of life in the Seabees. Upon determination of actual effort and resources expended on training and the actual pool of skilled craft resources currently in employment, the intent is to determine how effectively and efficiently the craft resource pool is currently utilized by management. Specifically, the intent is to examine formal Navy Enlisted Classification (NEC) bearing schools, which are the equivalent of civilian journeyman technical trade schools. Personnel who have obtained one or more NECs, which are awarded after successful completion of a particular craft technical school, generally assume a Project Supervisory, Crewleader, or some other leadership role in the construction effort. Therefore, the study will focus on these key individuals, their skill capacity and talent, overall resource pool strength, and on how effectively these personnel are utilized by NCF management.

The overall intention of the study is not to point out flaws in the current NEC utilization system. SeaBees have performed remarkably in recent conflicts and obviously, the craft training has allowed a well trained and fully capable force to accomplish a wide range of construction tasking. Rather, in light of military downsizing and rapidly reducing resource allocations, the intent is to suggest improved methods of managing the craft skill pool while minimizing underutilization of skilled personnel, should such a situation be determined.

1.3 Thesis Organization: The scope of this study will encompass an orientation to the Naval Construction Force (NCF), NCF technical craft training formats, and the actual capitalization upon the skills available in the craft skill resource pool as follows: Chapter Two provides an explanation of the U. S. Naval Construction Force (NCF) and inherent construction craft types and strength. Chapter Three focuses on a description of craft training types, frequencies, and levels; specifically focused on NEC schools and the NEC obtaining and assignment process.

Chapter Four details an analysis of required craft training and manning levels versus the actual resource pool currently employed, as well as an analysis of technical school funding and related costs associated with NEC schools. Chapter Five outlines the data collection format and methodology and examines the validity of data received. Chapter Six provides the analysis and results of a craft survey received from 115 First Class Petty Officers aimed at determining how effectively their skills have been utilized by NCF management and how their current NMCB assignments or positions relate to NEC skills possessed. Chapter Seven contains proposed recommendations and alternate management practices regarding the utilization of NEC skill holders within the NMCB operational guidelines. And, Chapter Eight provides a summary of and conclusions reached as a result of the study, as well as the authors recommendations.

The reader experienced in the topic matter may choose to briefly analyze Chapter Six for NEC Utilization Survey results and proceed to Chapter Seven, where suggestions are presented for varying and potentially improved CEC management practices regarding current NEC resources available. In brief, these practices are summarized, in order of cost and difficulty of implementation, as:

- Upper Management Education
- Restriction of OF-13 Personnel to two NCF specific NECs
- Creation of Special NEC Staffs
- Revision of Brigade Tasking Assignments to Battalions
- Detailer Management of NEC Position Assignments
- NCF Reserve Tasking

In addition, the thesis survey, survey results, and thesis summary of recommendations may be quickly reviewed by referring to Appendix E.

Chapter Two

The U. S. Naval Construction Force

2.1 General Overview: Today's U. S. Navy SeaBees remain one of three primary facets of the U.S. Navy Civil Engineering Corps (CEC). Seabees have recently been deployed in mass for action in Somalia and Iraq. As a result of their versatility, mobility, construction skill, defensive firepower and military skills, the SeaBees have become the engineering and construction force of choice among all U. S. Armed Services. SeaBees maintain a permanent presence on virtually every naval base throughout the world accomplishing Public Works related and minor construction facilities improvement projects. In addition, through routinely scheduled peacetime forward deployments and exercises, SeaBees continuously practice their wartime construction skills by renovating or constructing facilities and utilities infrastructure on major naval installations, as well as undertaking military and humanitarian assistance construction projects around the globe.

2.2 Mission Statement: The following subsections explain the current employment and mission assignment of U.S. Navy SeaBees.

2.2.1 Wartime: The wartime mission of the NCF is to provide all advanced base construction support for the U. S. Marine Corps. Generally, the NCF component will be attached to and controlled by a Marine Engineering Force (MEF). In this capacity, SeaBees will generally be tasked to construct airstrips, landing pads, roads, bridges, camp infrastructure, barracks, etc. as determined by the Marine attacking force. The SeaBees generally follow immediately behind any Marine advance and provide the engineering support required for the advancing attack to proceed. Also, in general, the SeaBees provide an element of the defensive posture in

the Marine " Rear Area," which encompasses the logistical and support personnel required to allow the attack to advance. In addition, the unique engineering and construction capabilities the SeaBees can provide are often tapped by other services. A recent example is the refurbishment of a partially destroyed embassy for use by U. S. Army Forces while securing peace in Bosnia, and the construction of associated Army camps for personnel involved. As a further example, a relatively small contingent of SeaBees constructed all camp facilities and related infrastructure in Guantanamo Bay, Cuba for the support of more than 25,000 Cuban refugees attempting to flee their country in 1994.

A Naval Mobile Construction Battalion (NMCB), the basic element of the NCF, is comprised of approximately 610 men and women. Women were first allowed in NMCBs in 1994, yet still comprise a relatively small percentage of total personnel. Of the 610 personnel assigned for duty, sixteen are Civil Engineering Corps (CEC) Officers, six are related specialty Officers, and roughly 590 are Enlisted Personnel. The Officers are responsible for providing the overall construction liaison, engineering, guidance, and administration; much like the main office of a civilian construction firm. The Enlisted personnel provide the actual field construction and support workforce. A NMCB is fully self contained and self supportable for an extended period of time. A Battalion is equipped with the Administrative, Medical, Dental, Supply, Religious, Food Service, Mail, Pay, Weapons, and Construction Material Support personnel required to conduct daily operations relatively independent from outside support.

As denoted by the title, a NMCB is mission oriented to be fully and quickly mobile and deployable. All camp support and weapons/defense related facilities or needs are containerized and stored for air transport. Most Civil Engineer Support Equipment (CESE), of which there are roughly 250 pieces of heavy construction equipment, are designed to be air transportable via current Air Force transport assets. In addition, construction project materials for specific standardized needs, a 40 foot

water tower or 10,000 metal fuel tank for example, are pre-engineered, pre-purchased, and in storage for container air transport as well.

If called upon, a Battalion deploys in the following time elapsed manner:

1. Air Detachment - Roughly 90 men and 30 pieces of CESE capable of departing in two days and self-sustainment for 30 days.
2. Air Echelon - The majority of the Battalion and related supplies, material, and equipment. Capable of departing in six days and self sustainment for 15 days.
3. Sea Echelon - Approximately 25 support personnel and 15 pieces of CESE excessively large for air transport and requiring slower sea transport. Also capable of departure in six days.

In summary, a Naval Mobile Construction Battalion (NMCB) is designed to provide rapid and complete construction capabilities where and when called upon. Although not trained to provide detail or finish construction work, a Battalion is self contained to provide facilities and utilities in a temporary, contingency environment, as well as horizontal construction work as required for a wide range of wartime related possibilities. A NMCB essentially parallels a fully independent civilian construction firm when considering crafts required, equipment management, central (office) management, supply and material procurement, and personnel issues. The two major differentials are that NMCBs are additionally trained and outfitted to be rapidly mobile and are capable of providing defense in a combat or wartime scenario.

2.2.2 Peacetime: During peacetime, the primary mission of a NMCB is training. The training cycle is comprised of a fourteen month period, of which seven months are spent in the home base, or "homeport," and seven months are spent forward deployed to one of four overseas naval bases undertaking actual construction projects emphasizing SeaBee craft training. Overseas deployment camps are currently located in Rota, Spain; Roosevelt Roads, Puerto Rico; Okinawa, Japan;

and the U. S. Territory of Guam. In addition, several detachments of ten to eighty men are deployed from the "Mainbody" deployment site as a relatively independent entity to perform construction tasking at naval bases in the near vicinity or "theater." Also, a deployed Battalion may participate in several "Deployments for Training (DFTs)" in which thirty to sixty men, materials, camp facilities, and construction equipment are deployed for two to three months to undertake a construction project in a simulated combat environment. While in this forward deployed status, a given Battalion is known as the "Ready Battalion," or first to deploy if called upon for a specific contingency undertaking in the given theater.

The homeport period of seven months is spent undergoing military skills training and classroom craft specific technical training, as well as performing several small practice craft related construction projects on base or in the local community. The technical training is comprised of specialty schools of varying lengths and depth, and will be addressed in the following chapter.

2.3 NCF Structure: As stated previously, the lowest and most basic element of the Naval Construction Force (NCF) is the Naval Mobile Construction Battalion (NMCB). Currently, the active duty segment of the NCF is comprised of four Battalions (NMCB 1, 7, 74, & 133) stationed on the East Coast at Construction Battalion Center (CBC), Gulfport, MS and four Battalions (NMCB 3, 4, 5, & 40) stationed on the West Coast at CBC Port Hueneme, CA.. This active duty force totals approximately 4,800 U. S. Navy active duty Battalion personnel, with an additional 1,000 to 1,200 civilian and military personnel in support. Paralleling the active duty Battalions are roughly twenty Reserve Battalions, which are dispersed throughout the country and limited to weekend Reserve related training. In addition, an equal number of SeaBees are stationed at various shore commands in the United States and overseas naval bases while on shore assignment.

The four Battalions are administered, trained and controlled by two Naval Construction Regiments (NCR), one active and one Reserve. The active Regiment provides required technical and military training to the Battalions while in homeport and monitors the deployment readiness and capability of each Battalion. In addition, they serve as the engineering design and material procurement source for each Battalion while deployed to the respective East or West Coast theater. The Reserve Regiment is limited in depth of involvement during peacetime operations and generally expends "drilling time" to keeping abreast of developments and activity occurring in the active Regiment.

Each of the two Regiments and the four Battalions are centrally controlled by a Naval Construction Brigade (NCB). The NCBs impose and monitor the training requirements and statistics the Regiments are responsible for ensuring. In addition, the Brigades field requests from naval bases in the respective East and West coast theaters for SeaBee construction assistance or support and, according to capability, task the Regiments and Battalions to execute specific projects or exercises during their forward deployments. The Brigades also develop and implement administrative policies and monitor the turnover of forward camp facilities and equipment when one Battalion relieves another. In addition, they are ultimately responsible for safety, construction quality, and environmental programs and frequently inspect the overall construction performance of the Battalions while deployed.

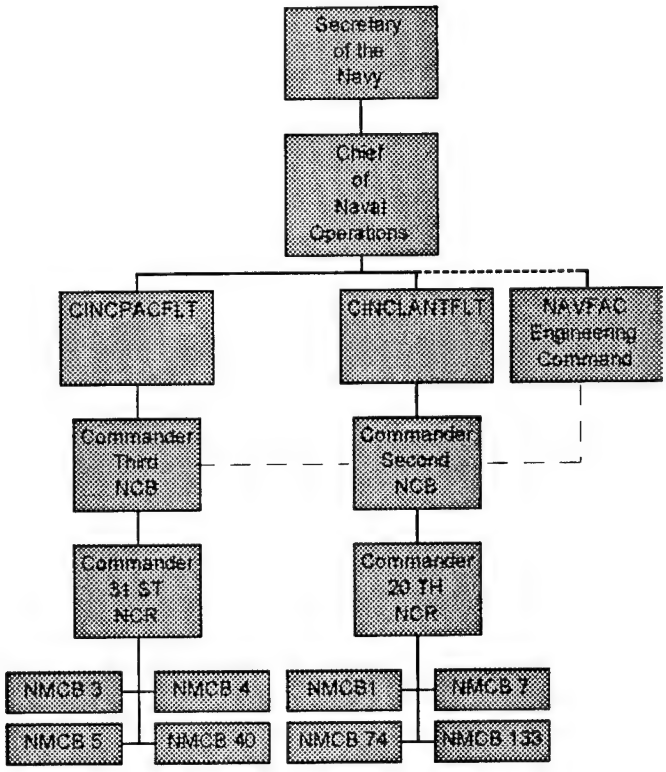
Each Brigade reports operationally to a Fleet Commander; Commander in Chief, Atlantic Fleet (CINCLANFLT) or Commander in Chief, Pacific Fleet (CINCPACFLT) as appropriate. The Fleet Commanders in Chief (CINCs) determine the actual training requirements and skills required for each Naval Mobile Construction Battalion and monitor combat and construction skills readiness as reported from the Battalion to the Regiment to the Brigade to the CINC. For example, if a Fleet CINC anticipates a potential conflict in South Korea, he may

require Battalions to develop a specific bridging skill for mountainous terrain that Brigades will order, Regiments will provide, and Battalions will obtain and perform if required. Additionally, each Brigade reports administratively to the Naval Facilities Engineering Command (NAVFAC), which is the parent command of all Civil Engineering Corps (CEC) Officers. NAVFAC determines administrative policies related to uniform wear, promotions, discipline, administrative support, and numerous other non-operationally or construction related topics.

In turn, each fleet CINC, as well as the Commander of NAVFAC, report directly to the Chief of Naval Operations, who reports through the Secretary of the Navy to the Secretary of Defense. However, despite the above elaborate chain of command and hierarchy description, the Seabees remain an extremely small part of the U.S. Navy and often operate in relative anonymity. As an example, then President George Bush, despite being a former Naval Officer engaged the Pacific campaign, was unaware of the existence of the Naval Construction Force in modern format until touring the recovery work accomplished by the SeaBees after Hurricane Andrew in Dade County, FL.. However, the total NCF annual operating budget is in the vicinity of $300 million, as a conservative estimate. Therefore, although a small portion of the U. S. Navy, as such the NCF can be considered a very sizable construction management corporation relative to civilian equivalents.

Figure 2.3.1 provides an overall organizational schematic for the Active Duty Naval Construction Force.

Figure 2.3.1 NCF Organization



2.4 Naval Mobile Construction Battalion Composition: As stated previously, a NMCB is comprised of roughly 22 Officers and 590 Enlisted Personnel. For the purposes of this analysis, only the construction related "Ratings," or crafts, will be examined. Construction specific Navy Ratings are designated as Occupational Field 13, or OF-13 Ratings. A Battalion is structured as follows:

- Headquarters Company: Headquarters Company is comprised of predominantly support, non OF-13 Ratings who administer non-construction related activities that ensure the Battalion can operate independently. Examples include Ratings which administer mail, pay, personnel records, administrative correspondence and record

keeping, medical and dental services, food preparation, consumable material and uniform procurement, weapons maintenance and administration, morale and welfare, material procurement, religious services, and photography or public relations. Construction related OF-13 Rating personnel are customarily assigned to augment the personnel responsible for governing many of these activities. In addition, Headquarters Company performs numerous construction overhead type activities which demand strictly OF-13 construction personnel. The most predominant of these are Training, Quality Control, Safety, Engineering, Construction Material Procurement, and Tool Issue and Repair. The major departments within Headquarters Company that control the aforementioned activities are Administration, Operations (Quality Control and Engineering), Supply, and Training. Headquarters is the largest Battalion Company, generally numbering approximately 135 personnel. The single OF-13 Rating generic to Headquarters Company is:

Engineering Aid (EA): Responsible for the maintenance of all project design drawings, updates or Redline drawings, materials testing, design sketches, technical consulting, and engineering related reports.

- Alfa Company: Alfa Company generally numbers around 100 to 110 personnel involved in the maintenance and operation of the Battalion's fleet of Civil Engineer Support Equipment (CESE), or heavy construction equipment. Alfa Company personnel perform all horizontal construction tasking including, earthwork, paving, material hauling, and crane lifts as well as performing preventative maintenance and equipment repair. Alfa Company generally is roughly evenly divided between the OF-13 Ratings of:

Construction Mechanic (CM): Responsible for preventative maintenance, repair, overall upkeep, repair parts ordering and storage, and record keeping for the CESE fleet, which is comprised of 250 pieces of heavy equipment.

Equipment Operator (EO): Equipment Operators, as the Rating title describes, operate all of the Battalion CESE, including loaders, backhoes, dozers, scrapers, forklifts, trucks, dumptrucks, pavers, and cranes. Equipment Operators also perform licensing, dispatch, yard control, and equipment issue and control functions.

- Bravo Company: Bravo Company typically numbers 70 personnel in strength and performs functions related to maintenance and upkeep of the Battalion camp as well as utility related construction services. The two most predominant Bravo Company related OF-13 Ratings are:

Utilitiesman (UT): Perform all construction functions related to water distribution, sanitary piping, and underground utility services. Utilitiesmen also perform Air Condition and Refrigeration related construction tasking.

Construction Electrician (CE): Construction Electricians perform all electrical construction tasking. Job aspects encompass panelboxes, underslab conduit placement, wiring, transformers, cable splicing, fixture installation, and high voltage work.

- Charlie Company: Charlie Company is generally the backbone of any Battalion's construction effort and usually numbers around 110 personnel in strength. Charlie company, due to the nature of most SeaBee work, is usually the "lead company" for a given project and controls most of the project planning and execution. The two predominant OF-13 Ratings attached to Charlie Company are:

Builder (BU): The equivalent of a civilian carpenter. Builders perform all concrete formwork and wood framing required for a particular structure. BU is a very versatile Rating as Builders also are involved in reinforcement steel bending and tying, concrete placement, and some steel erection.

Steelworker (SW): Steelworkers provide all metal related construction services including plate welding, pipe welding, torch cutting, sheet metal work, reinforcement steel bending, and structural steel erection, among others less common.

Steelworkers and Builders typically work closely together and most are skilled in both Ratings through on-the-job training and experience. As aforementioned, the majority of SeaBee work is geared around these two construction crafts, and Charlie Company usually plays a substantial role in the construction execution.

- Delta Company: Delta Company is typically a title reserved for the Detachments or "Details" that will operate somewhat independently from the "Mainbody" forward deployment site at a different naval or other military facility in the theater of operations. Delta Company is generally comprised of four or five Details, whose numbers and composition vary depending on the construction tasking assigned at the particular Detail location. Details are composed of personnel drawn from Headquarters, Alfa, Bravo, and Charlie Companies dependent upon the local support available and nature of the construction tasking assigned.

A NMCB is organized in somewhat of a matrix format. The major construction related crafts, or OF-13 Ratings, are divided into three distinct Companies, each providing skills unique from another. Upon tasking and project assignment, the "Lead Company" draws support, skill, manpower, equipment, and resources from partner Companies to plan and execute the project. The disbursement of labor, equipment, and materials relative to assigned construction tasking is governed by the Operations Officer, the third ranking Officer in a Battalion, who determines where and when specific assets are most needed. Upon completion, all assets and resources return to the parent Company. The only exception is Delta Company as the Details are assigned personnel as dictated by construction projects assigned for the duration of a deployment, and these personnel and resources are not

under the control or supervision of the parent "Mainbody" Company; but rather, under the control of the particular Detail.

In summary, a NMCB, as a sub-element of the Naval Construction Force is comprised of seven essential craft Ratings assigned to many different functions or jobs dependent upon the deployment construction tasking. To reiterate, the OF-13 naval craft Ratings under examination in this study involve:

- Engineering Aid (EA)
- Construction Mechanic (CM)
- Equipment Operator (EO)
- Utilitiesman (UT)
- Construction Electrician (CE)
- Builder (BU)
- Steelworker (SW)

The corresponding paygrades, or Rates within all Enlisted Navy Ratings, listed from lowest to highest with rough estimates of experience, are:

- Seaman Recruit (E1) - 1 Year
- Seaman (E2) - 1 to 3 Years
- Constructionman (E3) - 2 to 4 Years
- Petty Officer Third Class (E4) - 3 to 7 Years
- Petty Officer Second Class (E5) - 4 to 8 Years
- Petty Officer First Class (E6) - 8 to 20 Years
- Chief (E7) - 12 to 20+ Years
- Senior Chief (E8) - 15 to 20+ Years
- Master Chief (E9) - 18 to 20+ Years

Chapter Three

Training Formats

3.1 General Overview: Training is the everyday life of most U. S. Naval personnel. Combat or contingency situations involving the skills inherent in the Navy are rare; however, in order to perform effectively in such an environment, U. S. Navy personnel continuously train for preparedness. This training environment is applicable to the SeaBees and associated OF-13 Ratings as well.

Training begins for each Enlisted recruit upon induction into the Navy. Initial training is the traditional "Boot Camp" where personnel are instructed on the basics of military life which include history, rank structure, behavior, conduct, basic military skills, uniform wear, etc.. Following successful completion of Boot Camp, a SeaBee begins construction craft related training in the particular Rating which he or she has chosen.

For many years, the U. S. Navy conducted it's own construction craft schools. However; recently, the Army, Navy, and Air Force have consolidated to provide basic construction craft training to all recruits in order to eliminate redundant training and associated expenditures. Technical Schools Commands, under the title of Naval Construction Training Centers (NCTC) are present on both SeaBee bases and provide "A" schools for four of the seven crafts, the remainder being provided by the Army and Air Force at separate locations.

3.2 "A" School: "A" School is the first Rating specific training a new SeaBee recruit will encounter upon enlistment. These schools are typically ten to twelve weeks in length and provide SeaBees with the basic construction skills necessary to perform the requirements of their particular Rating. For example, a Builder (BU) recruit will spend three to four months learning to perform formwork design, concrete

placement, framing, roofing, sheetrock placement and finishing, reinforcement steel fabrication, etc.. An Equipment Operator (EO) will learn the basic skills required to operate the most easily handled pieces of CESE. A Construction Electrician (CE) will learn basic wiring and electrical theory. Or, a Steelworker will learn the essentials of gas cutting and gas mixtures, arc welding of sheet steel, and basic sheet metal fabrication techniques. "A" schools are not designed to produce experts in any given craft; but are designed to provide the rudimentary construction craft skills necessary for an individual to perform productively and contribute to the construction effort. The civilian equivalent of these schools is comparable to a high school or high school graduate vocational trade school. However, "A" Schools are advanced in complexity and much more intensely administered.

3.3 Special Construction Battalion Training (SCBT): Battalions undergo Special Construction Battalion Training (SCBT) classes during their homeport period only. SCBT classes are conducted by the NCTCs and a vast majority are specific to a particular craft. SCBTs typically average two to three weeks in length, are designed around SeaBees with two to three years experience, and expand upon the basic skills taught in the "A" schools. Craft, or Rating specific SCBT examples include:

Engineering Aid (EA)	Construction Mechanic (CM)
Nuclear Densometer Operation	Engine Overhaul II
Soils & Pavement Analysis	Tune-Up (Diesel) II
Surveying II	Equipment Electrical
Equipment Operator (EO)	Utilitiesman (UT)
Soil Stabilization	Shore Based Boilers
Crane and Attachments	Pumps & Compressors
Tractor/Trailer Operations	Air Conditioning & Refrigeration
Construction Electrician (CE)	Builder (BU)

Cable Splicing

Interior Wiring II

Motor Rewinding

Steel Worker (SW)

Arc Welding (Structural)

Pipe Welding

Sheet Metal II

Masonry Unit Construction II

Roofing

Concrete Forming & Reinforcing II

The SCBT load and composition varies from homeport to homeport. Classes are scheduled and conducted in order to meet minimum readiness levels prior to forward delpoyment, as dictated by higher authority imposed training and readiness instructions. More than 90 SCBT courses exist; however, a Battalion will typically schedule 30 to 35 SCBT classes per homeport, depending on the personnel and associated skills onboard.

In addition to SCBT classes, Battalions also undergo a wide range of mission imposed contingency construction training classes. The most prominent are Rapid Runway Repair, Disaster Recovery, and Crew Construction Training exercises related to water well drilling, heavy timber tower construction, lodging construction, and camp facilities erection. The homeport also involves a significant amount of military skills training related to weapons proficiency, communications, and defensive combat operations.

3.4 Navy Enlisted Classification (NEC) Bearing or Formal "C" Schools: NEC Bearing "C" schools, sometimes referred to as "Formal Schools," are by far the most intense and important SeaBee schools offered and are instructed by the NCTCs as well. "C" schools are restricted to personnel with ten to twelve years of experience and completion designates the individual as a "Foreman" in his field. "C" schools are generally eight to thirteen weeks in length and designed to make the individual

SeaBee a relative expert in the particular class topic or field. They are much more intense and demanding than any previous schooling and generally, highly sought after with a high degree of competition for the seats offered. Formal Schools require the detachment of the student under Temporary Duty Orders to the NCTC in order to ensure training time and student availability are not compromised by NMCB related responsibilities. The completion of a "C" school also results in a NEC Code placed in the individual's record. This NEC Code, in theory, is then used by the Navy to place the individual in certain future positions designated as requiring an individual holding the NEC. An individual may have one or more NECs, depending on his Rating and background. The NEC Code structure, personnel strength within the NEC Codes, and utilization of those personnel are the central focus of this study.

Table 3.4.1 provides a summary matrix of the NEC skills most commonly encountered in the Naval Construction Force. The title headings of Rating, NEC, and Paygrade have been explained. The title heading of Sequence is an indicator of the relative importance of a NEC that will be fully explained in Chapter Four and the title heading of Source describes exactly which SeaBee Ratings may obtain a particular NEC skill. Each NEC skill is not necessarily available to all seven craft Ratings.

Table 3.4.1 NEC Summary

Rating	NEC	Title	Source	Sequence	Paygrade
Rating Specific					
EA	5501	Advanced Engineering Aid	EA	3	E5-E6
CE	*5601*	*Uninterruptible Power Supply (UPS) Maintenance*	*CE*	*4*	*E5-E7*
CE	5635	Advanced Construction Electrician	CE	3	E5-E6
CE	*5642*	*Central Office Exchange Technician*	*CE*	*4*	*E5-E6*
CE	5644	Cable Splicing Technician	CE	6	E5-E6
EO	5707	Water Well Drilling Technician	EO	4	E5-E8
EO	5708	Blaster	EO	4	E5-E7
EO	5710	Advanced Equipment Operator	EO	3	E5-E6
CM	5805	Advanced Construction Mechanic	CM	3	E5-E6
BU	5907	Advanced Builder	BU	3	E5-E6
BU	5908	Tool and Equipment Technician	BU	6	E5-E6
SW	6010	Advanced Steelworker	SW	3	E5-E6
UT	6104	Shore Based AC&R Technician	UT	4	E5-E6
UT	6105	Advanced Utilitiesman	UT	3	E5-E6
Open Rating					
EA	5501	Construction Inspector	All (CM)	3	E6-E7
CE	*5633*	*Mobile Utilities Support Equipment Technician*	*All (EA/BU)*	*3*	*E4-E9*
EO	*5712*	*Elevated Causeway System (MOD) Specialist*	*All(UT/BU)*	*4*	*E3-E8*
BU	5915	Construction Planner & Estimator Specialist	All(CM/EA)	3	E5-E7
BU	*5931*	*Advanced Underwater Construction Technician*	*All*	*2*	*E5-E9*
BU	*5932*	*Basic Underwater Construction Technician*	*All*	*2*	*E3-E6*
BU	*5933*	*Underwater Construction Technician Candidate*	*All*	*2*	*E3-E6*
SW	6021	Safety Inspector	All	2	E6-E8
**	9502	Instructor	All	7	E5-E6

()= Ratings excluded from NEC skill

NECs indicated in italics are not related to the Naval Mobile Construction Battalion mission and are not considered in this study.

Chapter Four

Current Training and Readiness Levels

4.1 ROC/POE Requirements: The requirements for all NCF training are derived from wartime mission scenarios developed at the CINC level. The CINCs determine the skills required of any unit based on Required Operational Capabilities/Projected Operating Environment (ROC/POE) variables. To reiterate the previous example, if CINCPACFLT, through long term future planning processes, anticipates another Korean conflict in the near future, he will tailor the capabilities of his forces to operate in that specific environment. SeaBees may be ordered to become proficient in a new bridging skill for the mountainous terrain and may have to undergo cold weather training to operate in a winter climate environment. ROC/POE requirements are given to the Brigades (NCBs) on each coast who in turn issue a joint instruction, COMSECONDNCB/COMTHIRDNCB Instruction 1500.1A, Naval Construction Force Training Requirements, that governs the complete spectrum of all NCF training. Specifically, for a NMCB, the 1500.1A mandates minimum numbers of personnel on board with specific skills. The skills required encompass a wide variety of areas; however, the 1500.1A focuses most directly on craft related SCBT and NEC minimum training levels. These levels, relative to skills and personnel currently onboard, are the basis for a Battalion's SCBT training plan and for the number of NEC vacancies which must be filled in order to meet required readiness criteria.

4.2 NEC Sequencing: As shown in Table 3.4.1 but not fully explained, NECs, when an individual has more than one, are prioritized by a Sequence Code. The Sequence Codes place emphasis on the skills most closely related to an individuals Rating, and on the more important NECs within that Rating. Figure 4.2.1 provides the following example:

Figure 4.2.1 NEC Sequencing

Command	Rating	Name	DNC1	DNC2	PNEC	SNEC	TNEC	QTNEC
NMCB 133	BU1	Flanagan	5915		5501	5915	5907	5908

5501 = Construction Inspector, Sequence Code (3)
5915 = Construction Planner & Estimator Specialist, Sequence Code (3)
5907 = Advanced Builder, Sequence Code (3)
5908 = Tool & Equipment Technician, Sequence Code (6)

BU1 Flanagan possesses three NECs of equal weight and a fourth NEC of lower Sequence Code, or lessor relative worth as related to his BU Rating. Therefore, the NEC Schools most recently completed are Sequenced higher, or as more valuable to the individual and the NCF. CE1 Martinez possesses four NECs of varying relative importance that are easily Sequenced. In either case, the First and Second NECs listed are the most critical. These NECs will be focused upon for future job or position assignments, and will be applied toward the overall strength and readiness of the organization to which the individual is assigned. The NECs are termed as follows:

Primary NEC (PNEC) - the highest or most important in the Sequencing chain

Secondary NEC (SNEC) - the next lowest in the Sequence chain

Tertiary NEC (TNEC) - the next lowest in the Sequence chain

Etc.

4.3 The Detailing Process: Two Naval Commands outside of the NCF control and administer the "Detailing" process, in which SeaBees are rotated among job or position assignments every three to five years. Typically, depending on his or her Rating, a SeaBee will spend four years in a "Sea Duty" assignment, of which NMCBs are included, followed by two to three years in a "Shore Assignment," which generally does not involve deployment away from the place of duty. The Enlisted Personnel

Rating, a SeaBee will spend four years in a "Sea Duty" assignment, of which NMCBs are included, followed by two to three years in a "Shore Assignment," which generally does not involve deployment away from the place of duty. The Enlisted Personnel Management Center (EPMAC) is responsible for monitoring all NEC holders and their current assignment as well as monitoring the NEC postures of the NMCBs. If a NEC holder rotates out of a Battalion, EPMAC recognizes the loss of the NEC holder and annotates that particular position as requiring a NEC replacement. This annotation is then forwarded to the Bureau of Naval Personnel (BUPERS) where Rating managers, or "Detailers," are responsible for the rotation and job assignments of Enlisted Personnel within that Rating. The Detailers function is to attempt to locate a rotating individual holding the NEC skill that has been vacated and to order the individual into the command requiring the NEC skill. If an individual matching the profile is unavailable in the timeframe required, another must be sent to the NEC School enroute to reporting to the Command requiring the skill, thus adding to the overall NEC resource pool.

NCF Detailers, relative to their counterparts in other Navy Occupational skills, "Reutilize," or fill NEC vacancies with personnel in possession of the NEC skill with a high degree of success. This is primarily due to the fact that NCF NECs change over time at the same rate as civilian construction craft methodology and practices change; that is, very slowly. Other community managers; Missile Technicians for example, are only able to reutilize NEC holding personnel for the time their NEC remains technically accurate. Rapid development in many highly technical NECs renders them useable for much shorter time periods.

From the example in Figure 4.2.1, BU1 Flanagan was Detailed, or "DNEC'd" into his present assignment based on his Secondary NEC of 5915, Planner and Estimator. The Detailers accomplished their reutilization mission by matching either his Primary or Secondary NEC with a job assignment requiring that particular NEC.

CE1 Martinez, on the other hand, was not sent to a position requiring a NEC (DNEC 0000) despite possessing four very valuable skills.

4.4 Current NCF NEC Strength and Reutilization: The Detailers at BUPERS continuously track and maintain NEC and personnel data for all NCF SeaBees, whether on sea or shore duty. As for NMCBs, Instruction 1500.1A directs minimum NEC manning levels for all NCF command types. Amphibious Construction Battalions (ACBs), Underwater Construction Teams (UCTs), Construction Battalion Units (CBUs), and other forms of NCF commands all retain unique NEC requirements as determined by the ROC/POE of the CINC. As previously stated, the function of a Detailer is to match an individual NEC holder with any one of a wide number of commands that require a NEC backfill, with the individuals sea/shore assignment posture a major consideration. In simple terms, Detailers make allocations from the total NEC resource pool to commands as required. If the requirement cannot be met, a new individual is trained to fill the requirement.

Table 4.4.1 provides a summation of the current NCF NEC resource pool levels broken down by NEC. The table title headings are defined as follows:

- "Billets" are defined as actual positions within the NCF requiring the particular NEC.
- "Inventory" is the number of personnel currently in the NCF holding the particular NEC as their Primary NEC. No consideration is given in total numbers for individuals who may hold the NEC as Secondary or Tertiary.
- "Excess" is defined as the total number of NEC holders currently in the NCF above and beyond those required to fill all Billets. An excess of roughly 100%, or double the actual Billets, is required to allow for the sea/shore rotation of personnel and can be considered a logical number. However, an excess figure of 150% may be

considered more realistic in order to accommodate flexibility and allow for discretionary decisions on behalf of a NMCB Commanding Officer.

- "Strength" is defined as the number of Primary NEC holders detailed to and actually filling a NEC coded Billet as a result of their Primary NEC.
- "Manning" is defined as the ratio of Strength to Billets and provides an indicator of how effectively the Detailers are filling NEC coded positions. And, as stated, Reutilization is an indicator of how effectively Detailers capitalize on placing existing NECs where required versus training new personnel.

Table 4.4.1 NCF NEC Strength and Reutilization

Advanced Engineering Aid (NEC 5503)					
	Billets	Inventory	Excess	Strength	Manning
E4	0	2	200.00%	1	N/A
E5	12	37	208.33%	12	100.00%
E6	21	58	176.19%	20	95.24%
E7	0	2	200.00%	5	N/A
Total	33	99	200.00%	38	115.15%
	Reutilization = 88%				

Advanced Construction Electrician (NEC 5635)					
	Billets	Inventory	Excess	Strength	Manning
E4	0	5	500.00%	1	N/A
E5	53	115	116.98%	40	75.47%
E6	51	157	207.84%	40	78.43%
Total	104	277	166.35%	81	77.88%
	Reutilization = 51%				

Cable Splicing Technician (NEC 5644)					
	Billets	Inventory	Excess	Strength	Manning
E4	0	4	400.00%	0	N/A
E5	33	58	75.76%	16	48.48%
E6	20	85	325.00%	18	90.00%
Total	53	147	177.36%	34	64.15%
	Reutilization = 39%				

Water Well Drilling Technician (NEC 5707)					
	Billets	Inventory	Excess	Strength	Manning
E4	0	1	100.00%	0	N/A
E5	1	24	2300.00%	10	1000.00%
E6	41	89	117.07%	32	78.05%
E7	2	45	2150.00%	8	400.00%
E8	0	1	100.00%	0	N/A
Total	44	160	263.64%	50	113.64%
	Reutilization = 63%				

Blaster (NEC 5708)					
	Billets	Inventory	Excess	Strength	Manning
E5	22	26	18.18%	10	45.45%
E6	18	87	383.33%	20	111.11%
E7	3	42	1300.00%	3	100.00%
E8	0	3	300.00%	1	N/A
Total	43	158	267.44%	34	79.07%
	Reutilization = 53%%				

Advanced Equipment Operator (NEC 5710)					
	Billets	Inventory	Excess	Strength	Manning
E5	33	70	112.12%	28	84.85%
E6	82	223	171.95%	114	139.02%
E7	0	14	1400.00%	11	N/A
Total	115	307	166.96%	153	133.04%
	Reutilization = 83%				

Table 4.4.1 (Con't)

Advanced Construction Mechanic (NEC 5805)					
	Billets	Inventory	Excess	Strength	Manning
E5	66	104	57.58%	45	68.18%
E6	87	198	127.59%	118	135.63%
E7	0	12	N/A	14	N/A
Total	153	314	105.23%	177	115.69%
	Reutilization = 92%				

Advanced Builder (NEC 5907)					
	Billets	Inventory	Excess	Strength	Manning
E5	53	94	77.36%	36	67.92%
E6	90	271	201.11%	93	103.33%
E7	0	6	N/A	6	N/A
Total	143	371	159.44%	135	94.41%
	Reutilization = 82%				

Builder Tool & Equip (NEC5908)					
	Billets	Inventory	Excess	Strength	Manning
E5	34	48	41.18%	20	58.82%
E6	10	56	460.00%	14	140.00%
E7	0	1	N/A	0	N/A
Total	44	105	138.64%	34	77.27%
	Reutilization = 65%				

Advanced Steel Worker (NEC 6010)					
	Billets	Inventory	Excess	Strength	Manning
E4	0	3	200.00%	0	N/A
E5	18	43	138.89%	18	100.00%
E6	37	104	181.08%	29	78.38%
E7	0	2	200.00%	2	N/A
Total	55	152	176.36%	49	89.09%
	Reutilization = 90%				

Shore Based AC&R Technician (NEC 6105)					
	Billets	Inventory	Excess	Strength	Manning
E4	0	1	100.00%	0	N/A
E5	58	56	-3.45%	34	58.62%
E6	53	105	98.11%	41	77.36%
E7	0	2	200.00%	4	N/A
Total	111	164	47.75%	79	71.17%
	Reutilization = 54%				

Advanced Utilitiesman (NEC 6105)					
	Billets	Inventory	Excess	Strength	Manning
E5	21	62	195.24%	21	100.00%
E6	37	109	194.59%	22	59.46%
E7	0	1	100.00%	1	N/A
Total	58	172	196.55%	44	75.86%

Table 4.4.1 (Con't)

Construction Inspector (NEC 5501)					
	Billets	Inventory	Excess	Strength	Manning
E4	0	0	0.00%	2	N/A
E5	0	1	100.00%	1	N/A
E6	38	227	497.37%	63	165.79%
E7	84	144	71.43%	39	46.43%
E8	0	14	1400.00%	10	N/A
Total	122	386	216.39%	115	94.26%
	Reutilization = 32%				
Construction Planner and Estimator Specialist (NEC 5915)					
	Billets	Inventory	Excess	Strength	Manning
E4	0	1	100.00%	0	N/A
E5	14	44	214.29%	14	100.00%
E6	78	197	152.56%	68	87.18%
E7	17	84	394.12%	8	47.06%
E8	0	6	600.00%	1	N/A
Total	109	332	204.59%	91	83.49%
	Reutilization = 59%				
Safety Inspector (NEC 6021)					
	Billets	Inventory	Excess	Strength	Manning
E5	0	29	2900.00%	2	N/A
E6	25	168	572.00%	18	72.00%
E7	31	96	209.68%	13	41.94%
E8	4	30	650.00%	5	125.00%
E9	0	6	600.00%	0	N/A
Total	60	329	448.33%	38	63.33%
	Reutilization = 45%				

To illustrate an example, in total, the NCF maintains 60 Billets specifically structured and designated for a NEC 6021 Safety Inspector. Currently, there are 320 personnel of varying Paygrades carrying the NEC 6021 skill, or an excess of 448% in the skill resource pool. Again, 100 to 200% excess can be considered normal or acceptable due to Sea/Shore Detailing and personnel transfer. Of those 320 personnel, only a "Strength" of 38 total NEC 6021 holders are actually filling a Billet requiring the skill, leading to a "Manning" of 38/60, or 63%.

The data and numbers reflected in Table 4.4.1 are a reflection of NEC management on an overall NCF wide basis and do not necessarily reflect the actual NMCB level utilization of the NEC holder. The mission of the personnel at BUPERS and EPMAC is to manage numbers, quotas, and levels; not to manage people. The information is presented to give the reader an impression of the number of NCF NEC Billets by Rating and of the total numbers of Primary NEC holders in the NCF. Again, Secondary and Tertiary NEC holders are not counted; therefore, the actual numbers of particular NEC holders may be greatr than those shown. Once a NEC holder has been detailed to a command, the actual employment or job assignment given may be completely unrelated to the NEC for which he or she was Detailed. However, at the EPMAC and BUPERS level, a quota has been filled and the NEC holder is in place. Later chapters of the study focus on the more narrow cental study theme of utilization of NEC skills at the NMCB level.

4.5 Attainment Requirements and Current East Coast NMCB NEC Levels: Attainment is the term applied to the achievement of prescribed skill manning levels in a Battalion. Attainment is generally gauged or measured at the end of each homeport training period and less importantly, at projected future dates. The gauge at the end of the homeport period reveals the capability, or "strength," of a Battalion to fulfill ROC/POE requirements for the duration of their seven month deployment. The future projections of manning and training levels are used for the development of long term training plans in order to maintain skill levels fully manned, or as close as possible. A wide variety of skills are considered during the attainment measurement process; however, SCBT skills and NEC skills are monitored most closely. Focusing specifically on NECs, Table 4.5.1 provides NEC manning levels for a NMCB as dictated by Instruction 1500.1A.

Table 4.5.1 Required Battalion NEC Manning Levels

Rating	NEC	Title	Pers Req'd
EA	5503	Advanced Engineering Aid	2
CE	5635	Advanced Construction Electrician	6
CE	5644	Cable Splicing Technician	3
EO	5707	Water Well Drilling Technician	5
EO	5710	Advanced Equipment Operator	8
CM	5805	Advanced Construction Mechanic	5
BU	5907	Advanced Builder	12
BU	5908	Tool & Equipment Technician	2
SW	6010	Advanced Steelworker	4
UT	6104	Shore Based AC&R Technician	4
UT	6105	Advanced Utilitiesman	4
Open	5501	Construction Inspector	10
Open	5708	Blaster	4
Open	5915	Construction Planner & Estimator Specialist	7
Open	6021	Safety Inspector	2

In the attainment measurement process, only Primary and Secondary NECs held by Battalion personnel are applied to the required manning or "strength" levels. From the previous example in Figure 4.2.1, the NECs of 5501 and 5915 held by BU1 Flanagan would count towards the Battalion attainment level; whereas NECs 5907 and 5908 would not. Similarly, CE1 Martinez would contribute his 6021 and 5635 NECs to the attainment numbers and his 5644 and 9502 skills would not be recognized. The logic behind counting only the Primary and Secondary skills toward attainment is the fact that one single individual cannot be "spread too thin" and counted on to perform more than two NEC related functions at any one time or location. Therefore, a Battalion may have to train another individual in Cable Splicing (NEC 5644) despite CE1 Martinez holding the skill. This methodology creates much redundancy and overtraining in the NEC skill resource pool, but provides the flexibility needed when manning numerous and simultaneous project crews and Details.

The mission of a NMCB Training staff is to ensure all SCBT and NEC skill levels are fulfilled by coordinating and programming personnel for training in the skills

in which manning levels are or projected to be deficient. The NEC skill levels are deemed most critical in the Attainment process and are closely monitored. Table 4.5.2 provides a summary by NEC of the cumulative average Attainment levels of the four East Coast Battalions. As previously mentioned, Attainment is factored considering only Primary and Secondary NEC holders. The additional column in Table 4.5.2 titled "Actual Strength" includes Tertiary and Other NEC levels to reflect the total number of NEC holders assigned.

Table 4.5.2 East Coast NMCB Attainment

NEC	Title	Cumulative Attainment	Actual Strength
5503	Adv Engineering Aid	187.50%	187.50%
5635	Adv Construction Electrician	162.50%	170.80%
5644	Cable Splicing	208.30%	267.00%
5707	Water Well	120.00%	155.00%
5708	Blaster	156.30%	181.30%
5710	Adv Equipment Operator	196.70%	209.40%
5805	Adv Construction Mechanic	310.00%	310.00%
5907	Adv Builder	193.80%	208.30%
5908	Tool & Equipment Technician	187.50%	262.50%
6010	Adv Steelworker	231.30%	268.80%
6104	Shore AC&R Technician	162.50%	170.80%
6105	Adv Utilitiesman	118.80%	125.00%
5501	Construction Inspector	345.80%	354.20%
5915	Planner & Estimator	196.40%	214.30%
6021	Safety Inspector	1012.50%	1012.50%
9502	Instructor	162.50%	170.80%

As the above Table reveals, the East Coast NMCBs are well overtrained in all related NECs. However, the training levels revealed contain both positive and negative facets. On one hand, CEC management has a wide pool of NEC holders to assign craft related positions in the event a wartime mission is encountered and extreme flexibility is required. Conversely, relative to ROC/POE mandated training requirements, East Coast NMCBs possess far more NEC holders than essential to meet mission requirements. This situation creates two major points of consideration; one of the financial cost of creating the excess skill levels, and the other of effectively

utilizing the personnel holding those skills. Although a psychological or motivational investigation into the effects of underutilization will not be pursued, past studies have indicated the morale of a craftsman is negatively impacted when his or her potential is less than fully challenged. Refer to Appendix B for a detailed analysis of current NEC Attainment levels among East Coast NMCBs.

4.6 NEC "Formal School" Funding Requirements: The Fiscal Year 1994 Operations & Maintenance Budget (O&M,N) for NCTC Gulfport totaled $1.3 million, which if doubled for NCTC Port Hueneme totals $2.6 million. NCTC Gulfport is staffed with 197 personnel of Army, Air Force, Navy, and Civilian Personnel. Assuming a conservative $25,000 per year average salary, the NCTC payroll is $4.9 million, or $9.8 million when considering both NCTCs. The 1994 throughput of A School and SCBT Students at NCTC Gulfport totaled 5,667. The number of NEC School Students instructed was 218. Therefore, on a strictly non-weighted percentage basis, NEC Schools required roughly 4 percent of the combined overhead NCTC costs, or $500,000. This figure equates to $2,300 in strictly NCTC cost per NEC holder instructed.

Assuming the same salary of $25,000 per year for a First Class Petty Officer and an average NEC school length of ten weeks, the salary expense of the individual while attending a NEC school totals $4,800. The average cost of NEC class instructional materials is $1,000 per student; and the average Battalion spends roughly $500 in travel and per diem costs per student, despite most students sent to NEC schools while in homeport and minimal travel expense. In summation, a conservative total U. S. Navy cost per NEC School completed is roughly $8,500.

Assuming Fiscal Year 1994 costs and using a conservative number of two NECs held by a First Class Petty Officer (Table 6.1.2), the U.S. Navy holds at least a $17,000 investment in each First Class Petty Officer for strictly NEC skill training. If

multiplied by the 1,800 First Class Petty Officers currently in inventory, the NCF has invested $30.6 million in NEC training for the First Class skill resource pool currently available for construction related utilization. Again, this total figure is, in the author's opinion, a very conservative estimate and does not consider NEC holders in lower or higher Paygrades.

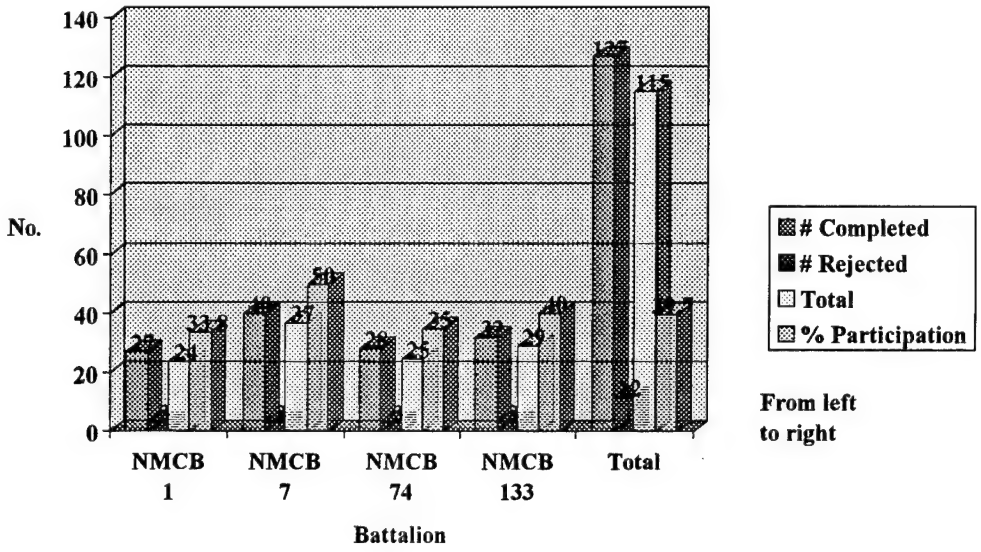
Chapter Five

Research Methodology

5.1 Data Collection: Two principle means of data collection were utilized for this study. Fully objective data collection in the areas of NEC requirements, NEC holding personnel, personnel locations/commands, and attainment and strength figures was accomplished through analysis of NCF training guidelines and personnel/NEC reports generated by EPMAC and BUPERS. More objective, as well as a substantial amount of subjective, data regarding NEC utilization and management within Battalions was gathered through the use of a twenty-eight question survey sent to First Class Petty Officers assigned to the four East Coast Battalions.

5.2 Survey Response: Eighty surveys were sent to each East coast NMCB (ONE, SEVEN, SEVEN FOUR, and ONE THREE THREE) with the intent of receiving responses from all 320 First Class OF-13 personnel assigned. A lessor response was anticipated from the two deployed Battalions (1 & 74) as numerous First Class Petty Officers are deployed to Detail sites and away from the Mainbody survey site. In addition, a less than complete response was anticipated from the homeported Battalions (7 & 133) as personnel are frequently on leave or otherwise committed and unavailable for response. Figure 5.2.1 provides survey response and participation figures.

Figure 5.2.1 Survey Completion Figures



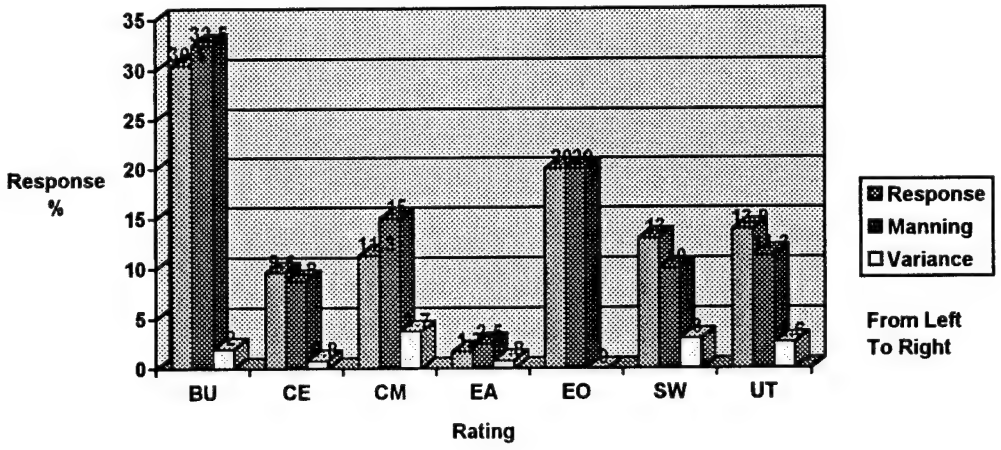
The overall participation response of roughly forty percent, although not as high as anticipated, can be considered a relatively substantial response for a mail survey data gathering effort. The total of 115 completed and valid surveys is considered more than sufficient for analysis of trends and common opinions and to provide an accurate overall NCF NEC utilization picture as seen by those on the receiving end of upper Civil Engineering Corps management.

5.3 Validity of the Data: The intent of question one was to determine the breakdown by Rating of all survey respondents and to determine if the responses received were consistent with a Battalion First Class Rating distribution. Table 5.3.1 provides a breakdown by Rating of responses received in comparison with a Battalion manning distribution. Figure 5.3.1 provides a graphical depiction of response breakdown with variances included.

Table 5.3.1 Survey Respondents Relative to NMCB Manning

	NMCB 1	NMCB 7	NMCB 74	NMCB 133	TOTAL	% TOTAL	MANNING	% MANNING	VARIANCE
BU	7	10	9	9	35	30.43%	26	32.50%	2.07%
CE	0	4	3	4	11	9.57%	7	8.75%	-0.82%
CM	6	1	3	3	13	11.30%	12	15.00%	3.70%
EA	0	2	0	0	2	1.74%	2	2.50%	0.76%
EO	7	10	2	4	23	20.00%	16	20.00%	0.00%
SW	3	6	3	3	15	13.04%	8	10.00%	-3.04%
UT	1	4	5	6	16	13.91%	9	11.25%	-2.66%
TOTAL	24	37	25	29	115	100.00%	80	100.00%	

Figure 5.3.1 Response Distribution Relative to NMCB Manning



As revealed by Figure 5.3.1, responses received were consistent with overall Battalion Rating manning levels and distribution. The largest variance is seen in the Construction Mechanic (CM) Rating, yet is only 3.7 %. Therefore, the survey responses and data obtained can be assumed to accurately reflect and represent a cross section of all SeaBee crafts.

5.4 Organization and Analysis of the Data: The survey questions were designed to encompass nine major areas of emphasis. The questions were randomly numbered so as to not create consistent thought patterns; but rather, to force the respondent to think about each individual question.

The initial survey analysis is intended to explore several aspects of the NEC program in general. Aspects include determining an average respondent, Detailing related factors, Formal School quality, and overall NEC program awareness. Latter questions and survey analysis groupings focus more specifically upon utilization of NEC skills possessed by the respondents and the overall perception of CEC management effectiveness. The nine main category groupings are as follows:

1. Average Respondent: Determine a general/typical career profile of an OF-13 (SeaBee) Petty Officer First Class (E6), as related to his/her NEC capacity.

Questions: 2, 3, 4, & 7

2. NEC School Assignment: Determine relative numbers of personnel sent to NEC Schools by Detailers and Battalions and the selection factors involved.

Questions: 8, 9, 20, 21, 22, & 23

3. NEC School Quality: Obtain an opinion from the E6 community on the caliber or quality of supervisory and technical skills the NEC schools are providing.

Questions: 15, 16

4. NEC Shore Utilization: Obtain an analysis on the Detailing of NEC holders to shore assignment and NEC skill utilization while on shore duty.

Questions: 24 & 25

5. NEC Program Knowledge: Determine if NEC holders have any personal idea of the inflated numbers of NEC holders the Naval Construction Force currently has onboard and how the NEC program, in general, operates.

Questions: 10, 26, & 27

6. NCF NEC Utilization: Determine the overall NEC utilization response on an NCF wide basis.

Question: 11

7. Battalion NEC Utilization: Determine if an individuals current Battalion position assignment is related to none or one or more NECs held. Obtain respondents opinion of how effectively his or her current assignment maximizes NECs held.

Questions: 5, 6, 12, 13, & 14

8. Management Practices: Obtain a general opinion from the respondents on current NEC utilization and management practices.

Questions: 17, 18, & 19

9. General: Obtain open comments or recommendations.

Question: 28

Chapter Six

NEC Utilization Survey

6.1 Average Respondent: The intent of questions two, three, and four was to determine the average number of years of experience of the respondent pool, whether or not they had transferred into the NCF from a previous non OF-13 Rating, or "Cross-Rated", and the average amount of years of experience in an NMCB, vice on shore or other assignment. The results of question four are shown; however, deemed by the author as incorrect. In retrospect, question four was worded somewhat vaguely and most respondents indicated the same amount of time in the U.S. Navy as in Battalions, leading the author to doubt the accuracy given Sea/Shore rotations. "NMCB" should have been used in the question versus "NCF," which encompasses all SeaBee sea and shore positions.

The term "cross-rated" refers to an individual who entered the U. S. Navy in an Occupational Career Field other than the construction related OF-13 Ratings and later transferred. An example may be a Gunners Mate (GM) who was fully trained in that specialty later transitioning to the Builder (BU) Rating, and therefore having spent less time in the Rating than the traditional career development path.

Table 6.1.1 provides survey response data for the following questions:

Question 2: How much time do you have in the U. S. Navy?

Question 3: Have you cross-rated from a previous Rating?

Question 4: How much time do you have in the NCF?

Table 6.1.1 Average Survey Respondent

Time in U. S. Navy (Years)		(Question 2)
NMCB 1	13.25	
NMCB 7	14.11	
NMCB 74	14.28	
NMCB 133	14.17	
Avg	13.95	

Time in NMCBs		(Question 4)
NMCB 1	12	
NMCB 7	12.8	
NMCB 74	10.84	
NMCB 133	13.52	
Avg	12.29	

Cross-Rated				(Question 3)
	Yes	%	No	%
NMCB 1	1	4%	23	96%
NMCB 7	2	5%	35	95%
NMCB 74	5	20%	20	80%
NMCB 133	2	7%	27	93%
Total	10	9%	115	91%

(Refer to Appendix C page 112 for the complete and detailed analysis of survey responses)

Therefore, per Table 6.1.1, the average respondent has roughly fourteen years of experience in the U. S. Navy, has spent slightly over twelve years of that time in a NMCB, and has mostly likely spent all of his or her time in the Rating first selected upon entering the service. Again, the response data regarding time in NMCBs is somewhat suspect. Given current sea/shore rotational times, an average figure of eight to nine years of time assigned to a NMCB would be more realistic.

Average NEC Profile: The intent of Question seven was to determine the average number of NECs held by the average First Class Petty Officer and to examine the average career points at which individuals obtained the NEC(s) held. Table 6.1.2 summarizes response data

*Question 7: How many years were you in the NCF before receiving your first NEC Bearing School?*_____

*Second?*_____

*Third?*_____

Table 6.1.2 Average NEC Breakdown

Average NEC Profile	(Question 7)			
	% With 1 NEC	% With 2 NECs	% With 3 NECs	% With 4+ NECs
NMCB 1	100.00%	58.30%	33.00%	16.67%
NMCB 7	100.00%	81.10%	46.00%	10.81%
NMCB 74	100.00%	72.00%	28.00%	8.00%
NMCB 133	100.00%	89.70%	44.80%	20.69%
AVG %	**100.00%**	**75.28%**	**37.95%**	**14.04%**

Average NEC Attainment Time (Years)	(Question 7)			
	1ST NEC	2ND NEC	3RD NEC	4+ NECs
NMCB 1	7.66	8.73	10.13	12.2
NMCB 7	6.35	10.4	11.76	12.6
NMCB 74	6.6	9.83	10.86	13.1
NMCB 133	7.72	9.85	11.23	12.9
AVG YRS	**7.08**	**9.70**	**11.00**	**12.70**

Table 6.1.2 indicates the average respondent most likely possesses at least two NECs with roughly forty percent in possession of three. The average career points at which awarding of NEC Schools most likely occur are shown as well.

6.2 NEC School Assignment: Question eight was a straightforward attempt to determine to what extent Detailers use NEC bearing schools as an incentive to an individual to remain in the Navy, or "Re-enlist" at a point in time when the individual is eligible to leave the service. Bonuses and guarantees of advanced training are two major tools Detailers utilize to retain trained and qualified personnel. The intent of question eight was to gather data to reveal if NEC schools guaranteed during the re-

enlistment process contribute significantly to the overall NEC resource pool. Table 6.2.1 details incentive related responses.

Question 8: Was your NEC School an incentive by Detailers for your Re-Enlistment?

Table 6.2.1 NEC Schools Offered As Detailer Incentives

	Yes	No	% Yes	% No	(Question 8)
NMCB 1	5	19	20.8	79.2	
NMCB 7	5	32	13.5	86.5	
NMCB 74	8	17	32	68	
NMCB 133	7	22	24.1	75.9	
Total	25	90			
		Average	**22.60%**	**77.40%**	

As determined from the survey results, roughly one quarter of the most recent NEC schools attended by First Class personnel were Detailer incentives. This contribution to the NEC resource pool can be considered as significant. However, typically, if granted a Formal School by BUPERS, the individual receives the school enroute to a following job assignment coded for that particular NEC. Therefore, this process of NEC obtainment is not considered to be a cause of any inflation or underutilization of the NEC resources available to CEC managers.

Question nine was included to examine how and when the E6 NEC holders currently in the NCF were selected to attend Formal Schools. Typically, due to the expense involved and the loss of productive labor, a Battalion will not send an individual to a Formal School while on forward deployment. Therefore, the intent of this series of questions was to determine how much of a role, relative to each other, Battalions and BUPERS play in the overall NEC attainment process. Table 6.2.2 summarizes survey results.

Question 9: Were you sent to your first NEC School by:

Detail Shop during PCS orders? *Yes* *No*

Your Battalion while in homeport? *Yes* *No*

Your Battalion while on deployment? *Yes* *No*

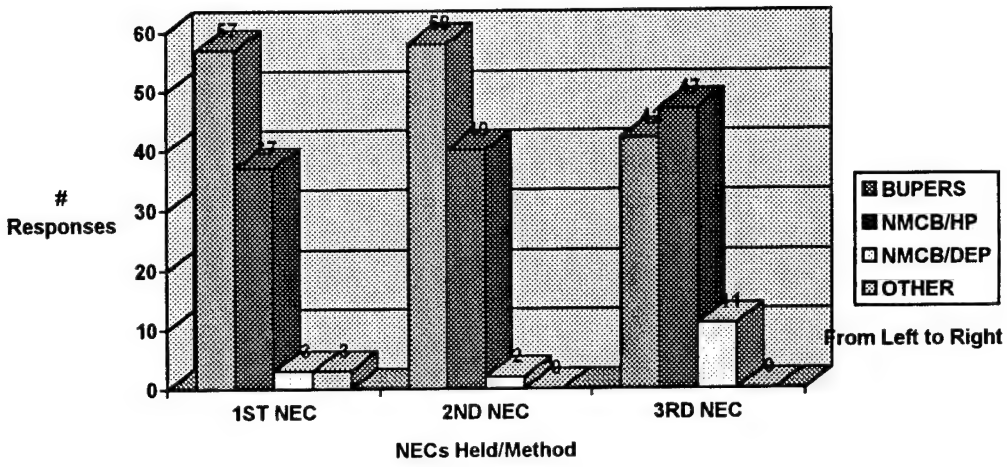
(repeated for Secondary and Tertiary NEC Schools)

Table 6.2.2 NEC School Assignment Methods

		(Question 9)					% Dist	% Dist
		NMCB 1	NMCB 7	NMCB 74	NMCB 133	Total	Overall	Actual
1ST NEC								
	BUPERS	15	12	20	18	65	56.52%	**56.52%**
	NMCB/HP	9	24	3	7	43	37.39%	**37.39%**
	NMCB/DEP	0	1	0	2	3	2.61%	**2.61%**
	N/A - OTHER	0	0	2	2	4	3.48%	**3.48%**
	Total	24	37	25	29	115	100.00%	100.00%
2ND NEC								
	BUPERS	8	17	12	13	50	43.48%	**58.14%**
	NMCB/HP	5	11	5	13	34	29.57%	**39.53%**
	NMCB/DEP	0	2	0	0	2	1.74%	**2.33%**
	N/A	11	7	8	3	29	25.22%	**0.00%**
	Total	24	37	25	29	115	100.00%	100.00%
3RD NEC								
	BUPERS	3	6	3	7	19	16.52%	**42.22%**
	NMCB/HP	5	9	4	3	21	18.26%	**46.67%**
	NMCB/DEP	0	2	0	3	5	4.35%	**11.11%**
	N/A	16	20	18	16	70	60.87%	**0.00%**

Figure 6.2.1 provides a graphical depiction of the above data showing the relative percentages of NEC schools assigned by Detailers and NMCBs.

Figure 6.2.1 NEC School Assignment Method (% Analysis)



The above graphics indicate a general sixty/forty split between BUPERS Detailers and NMCBs for assignment of Primary and Secondary NEC schools. While BUPERS maintains the majority of the NEC program management, as can be seen from Figure 6.2.1, Battalions retain a substantial role in the overall process of NEC Schools assignment and skill attainment. As the NEC program is a BUPERS controlled function, the amount of latitude granted to Battalions in the management of that function is somewhat surprising, given the fact that management of the NCF wide NEC pool is not a central NMCB mission or responsibility, and CEC management is not trained to understand or operate in that capacity..

Question twenty-one is an attempt to capture the perception of the First Class NEC holders on exactly how and why CEC management decides to send a particular individual to a Formal NEC School. Generally, an individual is sent to a school when another in a Battalion has left behind a NEC vacancy and his replacement does not hold the NEC vacated. Or, on many occasions, Formal Schools booked by the Detailers are not filled, leaving seats available for Battalions to capitalize upon. In either case, a screening and selection process occurs at the upper management level.

Table 6.2.3 lists, in order of descending importance and validity, the factors most commonly considered and the survey responses.

Question 21: What do you feel was the primary consideration for selection?

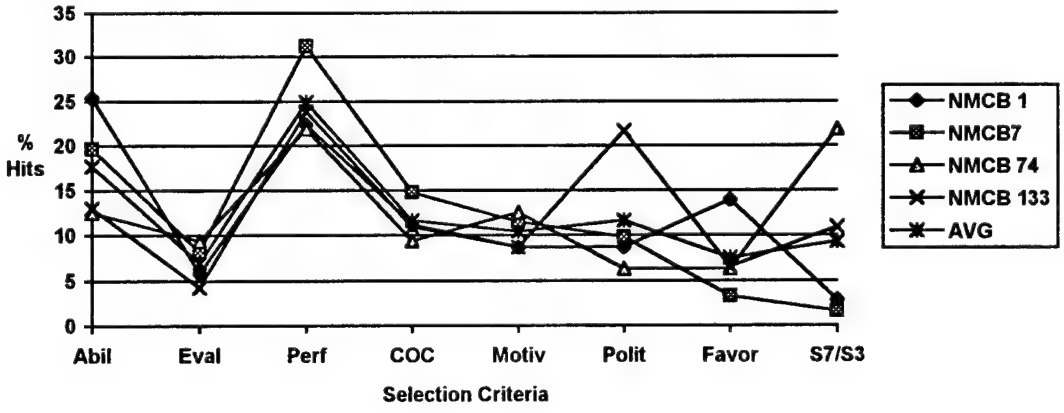
Ability	*Past Performance*	*Chain of Command Support*
Evaluations	*Motivation*	*Favoritism*
S7/S3 Random Selection		*Politics*

Table 6.2.3 NEC School Selection Criteria

(Question 21)	NMCB 1	%	NMCB 7	%	NMCB 74	%	NMCB 133	%	Avg %
Ability	9	25.4	12	19.7	4	12.5	6	13	**17.65**
Evaluations	2	5.8	5	8.2	3	9.4	2	4.3	**6.93**
Performance	8	22.4	19	31.2	7	21.9	11	23.9	**24.85**
COC Support	4	11.2	9	14.8	3	9.4	5	10.9	**11.58**
Motivation	3	8.7	7	11.5	4	12.5	4	8.7	**10.35**
Politics	3	8.7	6	9.8	2	6.3	10	21.7	**11.63**
Favoritism	5	13.9	2	3.3	2	6.3	3	6.5	**7.50**
S7/S3 Random	1	2.9	1	1.6	7	21.9	5	10.9	**9.33**
Total Hits	35	99	61	100	32	100.2	46	99.9	99.80

Figure 6.2.2 provides the above response data in line graph format.

Figure 6.2.2 NEC School Selection Criteria (Graph Format)



The above data indicates that, for the most part, the First Class community

feels the right personnel are being selected for the proper reasons. The peaks on Ability and Past Performance indicate that the best performers are being rewarded with additional NEC Schools. However, roughly forty percent of the responses hit on the lower end selection factors which should not be considered by management when assigning available NEC seats. In addition, NMCB 1 shows a peak on Favoritism, NMCB 133 has a moderate peak on Politics, and NMCB 74 has a large peak on Random Selection on behalf of the Operations Officer (S3) or Training Officer (S7). These peaks, along with the overall response data, show the NEC School assignment process retains several inherent flaws and the system needs refinement or change in order to eliminate the lower end selection criteria. In retrospect, the author realizes the inclusion of a factor such as "Number of NECs currently held" may have provided additional insight of some value to the study by determining if the E6 community feels CEC management is equally spreading the NEC "wealth" among available candidates.

The intent of questions twenty, twenty two, and twenty three was to determine the competitive environment for selection to attend a Formal Schools and how the First Class community felt about their peers selected for schools. In other words, these questions attempt to determine whether or not the NEC holders generally feel the right individual is selected for a particular NEC school and if upper management favoritism for particular individuals is a common issue in Battalions. Table 6.2.4 provides response summaries for the following:

Question 20: Did you feel a sense of competition for selection to attend a NEC School? Yes No

Question 22: Have you ever felt more qualified of professionally adept than others selected for a NEC School you were interested in? Yes No

Question 23: Have you ever sensed favoritism as a primary reason on behalf of upper management for selection to attend a NEC School? Yes No

Table 6.2.4 NEC School Selection Environment

Competition	(Question 20	Yes	No	Total	% Yes	% No
	NMCB 1	14	10	24	58.33%	41.67%
	NMCB 7	17	20	37	45.95%	54.05%
	NMCB 74	9	16	25	36.00%	64.00%
	NMCB 133	12	17	29	41.38%	58.62%
	Avg	13	15.75	115	**45.41%**	**54.59%**

Qualified	(Question 22	Yes	No	Total	% Yes	% No
	NMCB 1	7	17	24	29.17%	70.83%
	NMCB 7	10	27	37	27.03%	72.97%
	NMCB 74	10	15	25	40.00%	60.00%
	NMCB 133	14	15	29	48.28%	51.72%
	Avg	10.25	18.5	115	**36.12%**	**63.88%**

Favoritism	(Question 23	Yes	No	Total	% Yes	% No
	NMCB 1	10	14	24	41.67%	58.33%
	NMCB 7	7	30	37	18.92%	81.08%
	NMCB 74	8	17	25	32.00%	68.00%
	NMCB 133	10	19	29	34.48%	65.52%
	Avg	8.75	20	115	**31.77%**	**68.23%**

Again, for the most part, the respondents reveal a majority feeling that the right personnel are being selected for NEC Schools for the right reasons. One trend of note is the response to the competitive environment. The split in responses roughly equals the split in numbers between NEC Schools awarded by BUPERS Detailers and those awarded by Battalions. The author speculates those indicating "no" received their most recent NEC School form the Detailers, where competition is not present or a factor. Those indicating "yes" most likely received their NEC School assignment while in a Battalion where, whether they realize it or not, competition among candidates for selection certainly exists. The responses to questions twenty two and twenty three show a general seventy percent positive/thirty percent negative split. Perhaps the thirty percent may represent a "disgruntled minority." However, a number

of that magnitude may indicate, as in question twenty one, that refinement or restructuring of the selection process is required.

6.3 NEC School Quality: Questions fifteen and sixteen are straightforward questions aimed at determining how the respondents felt about the quality of instruction, course content, and overall caliber of the Formal Schools they attended. As most Formal School descriptors state "Employs the principles and techniques of foremanship," the questions were geared towards both technical knowledge and leadership or management skills learned. Table 6.3.1 provides survey response data and Figure 6.3.1 illustrates the same data in line graph format.

Question 15: On a scale of 1 to 10, how effectively do you feel your NEC School prepared you technically for a Project Supervisory type position?

Question 16: On a scale of 1 to 10, how effectively do you feel your NEC School prepared you managerially for a Project Supervisory type position?

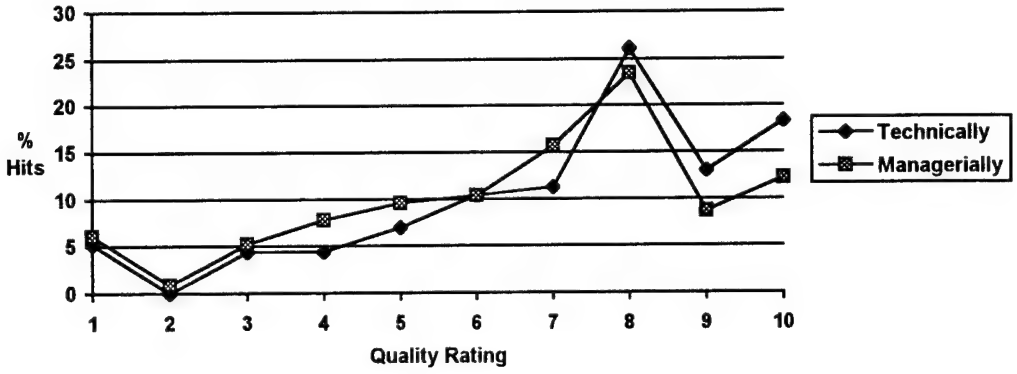
Table 6.3.1 Formal NEC School Student Ratings

Technically	Avg Rating	(Question 15)
NMCB 1	7.83	
NMCB 7	7.4	
NMCB 74	6.6	
NMCB 133	6.96	
Avg	7.2	

Managerially	Avg Rating	(Question 16)
NMCB 1	6.92	
NMCB 7	7.08	
NMCB 74	5.8	
NMCB 133	6.48	
Avg	6.57	

(See Appendix C page 118 for the detailed survey response analysis)

Figure 6.3.1 Formal School Student Ratings (% Analysis)



Although somewhat of a varied response, the majority of respondents replied favorably to questions fifteen and sixteen. The general data trends increase significantly in the upper end scale ratings, with eight out of ten the most common response. In each rating, roughly sixty percent or better awarded a rating of 7 or higher to the Formal Schools as instructed by the NCTCs. One point of note is the lag between technical and managerial responses in the upper end of the scale. As a substantial portion of Project Supervisory roles assumed by First Class Petty Officers involves project management skills, perhaps additional emphasis in this area by course developers and instructors is warranted.

6.4 NEC Shore Utilization: Questions twenty four and twenty five were designed to provide some input, although not necessarily directly related to the central theme of the study, regarding NEC utilization while on shore assignment and not in a NMCB. Although technically still in the Naval Construction Force, shore assignment is generally to a Public Works Department maintenance type of activity where construction is minimal relative to work performed while in an NMCB. Shore Duty may also involve assignment to a Construction Battalion Unit (CBU), which are small organizations of thirty to forty personnel that conduct small scale construction projects at selected naval bases. A CBU may typically require five or six varied NEC holders in a fifty personnel strong construction organization. There is a much smaller overall percentage of Shore assignments requiring a NEC and NEC utilization will not be addressed. Rather, the intent is to obtain an understanding of how frequently NEC skills are utilized and remain fresh or practiced while on Shore Duty. Table 6.4.1 summarizes survey responses to:

Question 24: During your last shore assignment, was your Detailing a result of your NEC(s), or did you have freedom to select your shore assignment?

NEC *Personal Choice*

Question 25: Have you applied your NEC skills while on shore Assignment?

Often *Rarely*

Table 6.4.1 Shore Assignment

Assignment	(Question 24)				
	NEC	Personal Choice	Total	% NEC	% Per Choice
NMCB 1	3	21	24	12.50%	87.50%
NMCB 7	4	33	37	10.81%	89.19%
NMCB 74	7	18	25	28.00%	72.00%
NMCB 133	3	26	29	10.34%	89.66%
Avg	4.25	24.5	115	**15.41%**	**84.59%**

Utilization	(Question 25)				
		Often	Total	% Rarely	% Often
NMCB 1	11	13	24	45.83%	54.17%
NMCB 7	13	24	37	35.14%	64.86%
NMCB 74	11	14	25	44.00%	56.00%
NMCB 133	16	13	29	55.17%	44.83%
Avg	12.75	16.25	115	**44.58%**	**55.42%**

As anticipated, very few NEC holders are Detailed to shore assignments as a result of their NEC(s). This situation is unavoidable as the vast majority of NEC coded billets are assigned to the deploying commands where NEC skills are much more critical to mission accomplishment. However, the utilization of NEC skills on shore assignment, whether in a NEC coded billet or not, is an important consideration. If a skill remains untapped or unused for a two or three year period, proficiency or adeptness in that skill invariably deteriorates. Shore commands essentially parallel NMCBs in the nature and type of construction work performed, only on a smaller scale and less frequently. Therefore, the opportunity to work in Rating related NEC skills should theoretically be available, but to a lessor degree. However, one half of the respondents indicated they rarely utilize NEC skills while on shore duty. Shore commands appear to capitalize upon only half of NEC talent available. This may be an inherent result of their structure or available construction work, or may be simply the result of not properly managing assets. More importantly, NEC holders returning to the more critical Battalion positions frequently lag behind their peers due to sustained craft skill dormancy.

6.5 NEC Holder Program Knowledge: Three survey questions were included to ascertain the level of knowledge the individual E6 maintains regarding the overall NEC program and how NEC skills held play a role in command Attainment and the Detailing process.

As stated, the mission of the Detailers at BUPERS is to match an NEC holder available for reassignment with an assignment that requires one of the NEC(s) the individual holds in order to maximize resources available. By and large, BUPERS accomplishes this task with extremely good reutilization rates of the NEC skills present in the resource pool (relative to other U. S. Navy entities in the non OF-13 Ratings). However, question ten was designed to determine if the individual NEC holder was aware of this necessity, or was knowledgeable of how the Detailing process works and why certain job or position assignments were offered to him or her by the Detailers.

Table 6.5.1 provides an analysis of responses to the straightforward question ten.

Question 10: Were you Detailed to your present assignment to fill a NEC vacancy? Yes No Do Not Know

Table 6.5.1 NEC Holder Detailing Awareness

(Question 10)	Yes	No	Don't Know	% Yes	% No	% Don't Know	Total %
NMCB 1	4	12	8	17.00%	50.00%	33.00%	100.00%
NMCB 7	17	13	7	46.00%	35.00%	19.00%	100.00%
NMCB 74	6	11	8	24.00%	44.00%	32.00%	100.00%
NMCB 133	8	16	5	27.60%	55.20%	17.20%	100.00%
Total	35	52	28				115
Avg	8.75	13	7	**28.65%**	**46.05%**	**25.30%**	

% Yes = 28.65

% No/Do Not Know = 71.35

The above graphic indicates roughly seventy percent of First Class Petty Officers are unaware of the importance of the NEC(s) they hold and are unaware of how the "Big Picture" Detailing process functions. The response percentages are not consistent with the Detailer Reutilization percentages shown in Table 4.5.1.
In other words, most First Class Petty Officers do not know or understand why they are currently assigned to their respective Battalions and do not realize they have been Detailed to fill a particular NEC vacancy. As mentioned in Chapter Four, Detailers make every effort to match the right NEC available to the particular job assignment requiring that NEC. However, apparently, this understanding has not been conveyed to the NEC holders on the receiving end of the Detailing process.

Questions twenty six and twenty seven were included in the survey for two reasons. First, as an indicator of how aware the First Class Community was regarding current training levels; and second, as an opportunity for them to express any thoughts or comments they may have regarding inflated numbers and manning in NECs such as Safety Inspector and Construction Inspector. Table 6.5.2 details respondents answers to:

Question 26: Did you know that certain NECs such as Safety Inspector and Construction Inspector are currently overtrained at 538% and 316%, respectively?

Yes No

To what would you attribute these numbers?

Question 27: Did you know that despite having 323 NEC 6021 Safety Inspectors in the NCF, we have only 60 total billets and only 38 NEC holders are actually filling a billet? Yes No

To what would you attribute these numbers?

Table 6.5.2 NEC Holder NCF Strength Awareness

Con Insp	(Question 26)	Yes	No	Total	% Yes	% No
	NMCB 1	1	23	24	4.17%	95.83%
	NMCB 7	6	31	37	16.22%	83.78%
	NMCB 74	0	25	25	0.00%	100.00%
	NMCB 133	3	26	29	10.34%	89.66%
	Avg	2.5	26.25	115	**7.68%**	**92.32%**

Safety	(Question 27)	Yes	No	Total	% Yes	% No
	NMCB 1	0	24	24	0.00%	100.00%
	NMCB 7	4	33	37	10.81%	89.19%
	NMCB 74	0	25	25	0.00%	100.00%
	NMCB 133	2	27	29	6.90%	93.10%
	Avg	1.5	27.25	115	**4.43%**	**95.57%**

The above data reveals the First Class Petty Officer community has a very low general knowledge level of NCF NEC training and strength levels. The NECs queried are both Open Rating NECs for which all respondents except Construction Mechanic are eligible. In addition, both of these NECs are valuable assets for career progression and looked favorably upon by promotion boards. As a result, the almost complete lack of familiarity with the numbers associated with these two NECs is somewhat surprising, yet reinforces the general lack of knowledge or understanding of the overall NEC program as revealed by question ten.

6.6 NCF NEC Utilization: Question eleven is one of the key thrusts of this study; that is, how effectively overall does the Naval Construction Force and the Civil Engineering Corps utilize the skills and resource pool at their disposal. The question was aimed at utilization from awarding of the particular NEC skill, regardless of shore assignment or assignment to an NMCB. Table 6.6.1 details the utilization responses, Figure 6.6.1 is a graphical depiction of same data, and Figure 6.6.2 provides a response percentage analysis.

Question 11: On a scale of 1 to 10, how effectively do you feel the NCF has utilized your Primary NEC related talents?

Secondary?

Tertiary?

Table 6.6.1 NCF NEC Utilization

Primary NEC	Rating
NMCB 1	6.71
NMCB 7	6.22
NMCB 74	5
NMCB 133	6.34
Avg	6.07

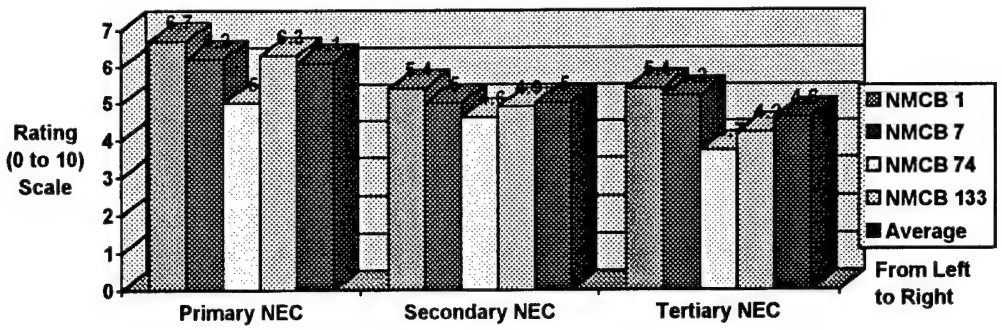
(Question 11)

Secondary NEC	Rating
NMCB 1	5.4
NMCB 7	4.96
NMCB 74	4.55
NMCB 133	4.88
Avg	4.95

Tertiary NEC	Rating
NMCB 1	5.4
NMCB 7	5.18
NMCB 74	3.71
NMCB 133	4.23
Avg	4.63

(See Appendix C page 122 for a complete and detailed response analysis)

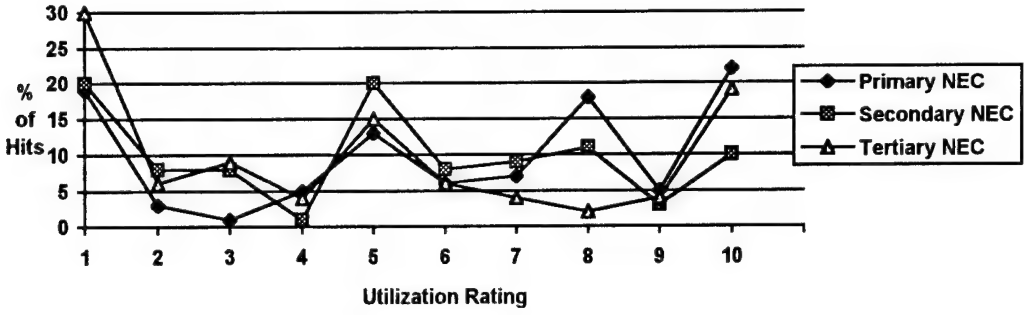
Figure 6.6.1 NCF NEC Utilization (Graph Format)



The preceding graphics show average utilization ratings of 6.4, 5.0, and 4.8 (on a scale of 10) for Primary, Secondary, and Tertiary NECs, respectively. Therefore, the overall average response for Primary NECs, the craft talent for which the individual has been trained, indicates the NCF is receiveing a roughly 64% return on training dollars invested. And, the return on investment drops significantly for Secondary and Tertiary NECs. The responses show consistent patterns among the four Battalions, with NMCB 1 giving a consistently high rating and NMCB 74 giving a consistent low rating. These trends most likely follow leadership and management practices regarding NEC assignment and utilization, with the Battalions more conscious of and effective at NEC placement receiving higher ratings from the First Class community. Although the question was phrased "NCF," the author suspects most respondents used their current Battalion tour as the grounds for survey response due to recent exposure and experiences..

Again, Figure 6.6.2 provides a percentage response breakdown of NCF utilization ratings for Primary, Secondary, and Tertiary NECs.

Figure 6.6.2 NCF NEC Utilization Rating Response (% Analysis)



The above graphic reveals no clear patterns in utilization responses, and is quite the opposite of the Bell curve one may expect. The only clear peak occurs at the 1, or lowest rating, for all three NEC levels. Somewhat of a peak also emerges at the 10, or highest utilization rating. Therefore, the data seems to indicate a NEC is generally either fully utilized or not utilized at all, with the ratings in between extremely sporadic and unpredictable. Yet, the most alarming figure remains the levels of lowest ratings given of all three NEC categories. Twenty percent of all respondents rated utilization of their Primary and Secondary NECs, the two most critical, at the lowest rating on the scale.

If an effective NEC utilization rate of seventy percent is considered a benchmark for return on investment of training time, effort and expenditures, the responses to question eleven may be further analyzed to determine how efficiently CEC Officers, as managers, have utilized the NEC resource pool. Table 6.6.2 illustrates the level of success to which the respondents feel their skills have been maximized.

Table 6.6.2 NCF NEC Utilization Benchmark Response

Primary NEC	(Question 11)	0 TO 70	70 TO 100	Total	% Below	% Above
	NMCB 1	10	14	24	41.67%	58.33%
	NMCB 7	18	19	37	48.65%	51.35%
	NMCB 74	15	10	25	60.00%	40.00%
	NMCB 133	12	17	29	41.38%	58.62%
	Avg	13.75	15	115	**47.92%**	**52.08%**

Secondary NEC		0 TO 70	70 TO 100	Total	% Below	% Above
	NMCB 1	8	7	15	53.33%	46.67%
	NMCB 7	23	7	30	76.67%	23.33%
	NMCB 74	10	8	18	55.56%	44.44%
	NMCB 133	17	9	26	65.38%	34.62%
	Avg	14.5	7.75	89	**62.74%**	**37.26%**

Tertiary NEC		0 TO 70	70 TO 100	Total	% Below	% Above
	NMCB 1	6	4	10	60.00%	40.00%
	NMCB 7	12	5	17	70.59%	29.41%
	NMCB 74	5	2	7	71.43%	28.57%
	NMCB 133	10	3	13	76.92%	23.08%
	Avg	8.25	3.5	47	**69.73%**	**30.27%**

Table 6.6.2 reveals that slightly fewer than half of the respondents indicated that NCF and CEC management had done a satisfactory job of Primary NEC skills utilization when considering seventy percent a benchmark. The figures deteriorate rapidly to thirty seven percent and thirty percent when the same principle is applied to Secondary and Tertiary NECs, respectively. These results may indicate management concerns itself with utilizing Primary NECs only, or that Battalion positions which capitalize upon one or more skills simultaneously do not exist. The author doubts the latter to be the case, as, for example, a Builder (BU) Project Crew Leader could utilize Builder Advanced, Planning and Estimating, Quality Control, or Safety NEC knowledge while in that particular assignment.

6.7 Battalion NEC Utilization: From this point forward, the central topic of this study is narrowed from Naval Construction Force (sea and shore) wide assignments and NEC utilization to the four East Coast Battalions and NEC holder job assignments within those Battalions. The object of questions five and six was to determine if the individual NEC holder was assigned to a current Battalion position related to one or more NECs held, whether Primary, Secondary, or Tertiary. Determination of NEC correlation was based on the author's subjective judgment, as well as the respondents answer to question fourteen in which the individual indicates his or her feelings on how effectively the current assignment maximizes NEC skills held. Table 6.7.1 details survey responses to the following:

Question 5: What is your current Battalion position?

*Question 6: What is your Primary NEC?*_____

*Secondary NEC?*_____

*Tertiary NEC?*_____

*Other (if applicable) NEC?*_____

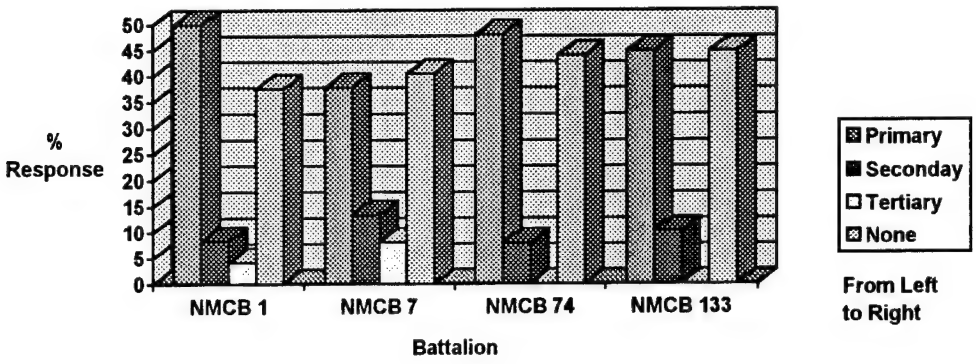
Table 6.7.1 Current NMCB Utilization of NECs Held

(Question 5/6)	Primary NEC	Secondary NEC	Tertiary NEC	None	Total
NMCB 1	12	2	1	9	24
NMCB 7	14	5	3	15	37
NMCB 74	12	2	0	11	25
NMCB 133	13	3	0	13	29
Total	51	12	4	48	115
% Grouping	44.35%	10.43%	3.48%	41.74%	100.00%

Related = 58.26%
Non-Related = 41.74%

Figure 6.7.1 provides a graphical representation of the above information as a percentage breakdown of NEC holder Battalion position assignments as related to NECs held.

Figure 6.7.1 Current NMCB Assignment Utilization of NECs Held (% Analysis)



Survey responses to these questions indicate roughly 40% of First Class Petty Officers are filling a position assignment not related to any NEC held. In a NMCB structure, roughly 15 out of 80 positions generally occupied by First Class Petty Officers are not related to any NEC. Training Staff, Drug and Alchohol Counselor, and Company Administrative positions are examples. However, the 40% response remains higher than the 20% range which may be expected.

Questions twelve and thirteen are somewhat interrelated and expand on questions five and six. The intent is to encompass not only current Battalion position assignment, but also all position assignments held by individual respondents while in the current Battalion tour of duty. Table 6.7.2 analyzes responses regarding all positions held while in the current tour.

Question 12: Have you ever been given a Battalion assignment as a direct result of any of your NECs? Yes No

Question 13: Have you ever filled a Battalion position that was not related to any of your NECs? Yes No

Table 6.7.2 Battalion Position Assignments Based on NEC

Direct Result	(Question 12)	Yes	No	Total	% Yes	% No
	NMCB 1	10	14	24	41.67%	58.33%
	NMCB 7	22	15	37	59.46%	40.54%
	NMCB 74	9	16	25	36.00%	64.00%
	NMCB 133	13	16	29	44.83%	55.17%
	Avg	13.5	15.25	115	**45.49%**	**54.51%**

Not Related	(Question 13)	Yes	No	Total	% Yes	% No
	NMCB 1	9	15	24	37.50%	62.50%
	NMCB 7	14	23	37	37.84%	62.16%
	NMCB 74	11	14	25	44.00%	56.00%
	NMCB 133	14	15	29	48.28%	51.72%
	Avg	12	16.75	115	**41.90%**	**58.10%**

On average, Table 6.7.2 indicates less than half of the respondents felt they had ever been given a Battalion position assignment as a direct result of any NEC held and, paralleling questions Five and Six, roughly forty percent had filled a position not related to any NEC held. As the intent of the NEC program is to make available specifically trained personnel for NEC positions inherent in the Battalion structure, these numbers do not support the overall NEC program purpose.

Again, narrowing the scope from NCF wide to the current Battalion level, question fourteen is designed to determine how effectively NEC skills are being utilized within NMCBs. The question is essentially a repeat of question eleven, with "Battalion" substituted for "NCF." Table 6.7.3 and figure 6.7.2 show survey responses in tabular and graphical format, respectively.

Question 14: On a scale of 1 to 10, how effectively does your current position maximize your NEC related skills?

Primary?

Secondary?

Tertiary?

Table 6.7.3 NMCB NEC Utilization

Primary NEC	Rating
NMCB 1	5.41
NMCB 7	5.37
NMCB 74	4.84
NMCB 133	5.76
Avg	5.35

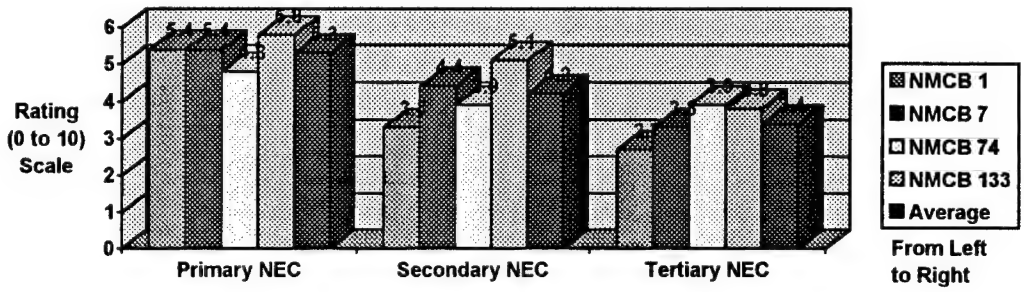
(Question 14)

Secondary NEC	Rating
NMCB 1	3.33
NMCB 7	4.4
NMCB 74	3.94
NMCB 133	5.08
Avg	4.19

Tertiary NEC	Rating
NMCB 1	2.7
NMCB 7	3.29
NMCB 74	3.85
NMCB 133	3.77
Avg	3.4

(See Appendix C page 125 for a complete and detailed survey response analysis)

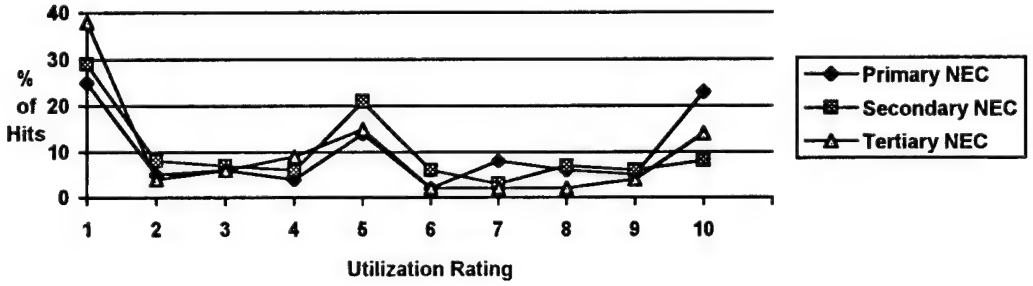
Figure 6.7.2 Battalion NEC Utilization (Graph Format)



The preceding figures indicate a high utilization rating of 5.4 on a scale of 10 with an overall Primary NEC utilization rating of 5.2. Therefore, the respondents indicate current construction tasking and CEC position management practices are only tapping roughly one-half of the Primary NEC skills and talent available. The figures additionally reveal a sharp drop in utilization of Secondary and Tertiary skills at 4.2 and 3.4 out of a possible 10 rating, respectively.

Figure 6.7.3 provides a percentage breakdown of survey utilization rating responses for each NEC category.

Figure 6.7.3 NMCB NEC Utilization Rating Response (% Analysis)



The trends and patterns revealed in Figure 6.7.3 are very similar to those regarding overall NCF NEC skill utilization as shown in Figure 6.6.2. That is, the response is the complete opposite of the Bell curve one would expect. In addition, the peak ratings for Primary, Secondary, and Tertiary NEC utilization again appear at the lowest possible rating of one out of ten. Smaller peaks appear at the high rating of ten out of ten, and the remainder of responses are again sporadic and unpredictable. Therefore, as in the NCF wide ratings, a Battalion appears to utilize a NEC either fully or not at all, with an indiscernible pattern of utilization within the two extremes. However, most alarming is the peak rating of 1 out of 10 in all three NEC categories.

As similarly analyzed for NCF NEC utilization, Table 6.7.4 provides an analysis of effective NEC utilization at the Battalion level, again using seventy percent, or a rating of seven or higher, as the benchmark for effective NEC skill management.

Table 6.7.4 NMCB Utilization Benchmark Response

Primary NEC	(Question 14)	0 TO 70	70 TO 100	Total	% Below	% Above
	NMCB 1	13	11	24	54.17%	45.83%
	NMCB 7	21	16	37	56.76%	43.24%
	NMCB 74	16	9	25	64.00%	36.00%
	NMCB 133	16	13	29	55.17%	44.83%
	Avg	16.5	12.25	115	**57.52%**	**42.48%**
Secondary NEC		**0 TO 70**	**70 TO 100**	**Total**	**% Below**	**% Above**
	NMCB 1	13	2	15	86.67%	13.33%
	NMCB 7	22	8	30	73.33%	26.67%
	NMCB 74	15	3	18	83.33%	16.67%
	NMCB 133	18	8	26	69.23%	30.77%
	Avg	17	5.25	89	**78.14%**	**21.86%**
Tertiary NEC		**0 TO 70**	**70 TO 100**	**Total**	**% Below**	**% Above**
	NMCB 1	9	1	10	90.00%	10.00%
	NMCB 7	14	3	17	82.35%	17.65%
	NMCB 74	5	2	7	71.43%	28.57%
	NMCB 133	10	3	13	76.92%	23.08%
	Avg	9.5	2.25	47	**80.18%**	**19.82%**

Table 6.7.4 reveals a decrease in overall effective NEC utilization from question eleven, the examination of NEC utilization on an NCF wide basis. This fact is somewhat ironic, given that NMCBs are the focal point of SeaBee construction activity. Slightly over forty percent of the respondents indicated they felt their skills had been utilized to a degree above the seventy percent benchmark, with roughly sixty percent indicating underutilization. More alarming again is the Secondary and Tertiary NEC responses in which only twenty percent indicated effective NEC skill utilization and eighty percent indicated their skills had not been capitalized upon.

6.8 NEC Management Practices: The intent of questions seventeen, eighteen, and nineteen, which are also interrelated, is to determine the perception of the First Class Petty Officer NEC holders of the degree of emphasis or attention CEC management places on NECs and personnel when actually making job or position

assignments within the Battalions. Table 6.8.1 summarizes the responses to these questions.

Question 17: Do you feel management has given assignments without regard to yours or others NEC(s)? Yes No

Question 18: Do you feel management studies or considers NEC skills prior to making position assignments? Yes No

Question 19: In general, do you feel the NCF manages an effective NEC training and utilization program that maximizes available resources? Yes No

Table 6.8.1 Management Attention to NEC Skills Held

Assignments Without Regard to NEC?				(Question 17)	
	Yes	No	Total	%Yes	%No
NMCB 1	12	12	24	50.00%	50.00%
NMCB 7	22	15	37	59.46%	40.54%
NMCB 74	18	7	25	72.00%	28.00%
NMCB 133	19	10	29	65.52%	34.48%
Total	71	44	115		
Avg	17.75	11		**61.74%**	**38.26%**

Mgmt Studies or Considers NECs?				(Question 18)	
	Yes	No	Total	%Yes	%No
NMCB 1	12	12	24	50.00%	50.00%
NMCB 7	19	18	37	51.35%	48.65%
NMCB 74	8	17	25	32.00%	68.00%
NMCB 133	7	22	29	24.14%	75.86%
Total	46	69	115		
Avg	11.5	17.25		**39.37%**	**60.63%**

The CEC Manages an Effective Program?				(Question 19)	
	Yes	No	Total	%Yes	%No
NMCB 1	12	12	24	50.00%	50.00%
NMCB 7	17	20	37	45.95%	54.05%
NMCB 74	8	17	25	32.00%	68.00%
NMCB 133	6	23	29	20.69%	79.31%
Total	43	72	115		
Avg	10.75	18		**37.16%**	**62.84%**

Table 6.8.1 reveals the rough sixty/forty split that has shown itself in several of

the subjective opinion response formatted questions. In this case, the data reveals that the majority of respondents do not feel Battalion CEC management involves itself with considering NEC skills prior to making individual personnel assignments. The individual Battalions follow trends throughout this series of questions, with NMCB 1 showing the most favorable results at fifty/fifty and NMCB 74 and 133 receiving much more negative favor. However, a fifty/fifty response is not exactly a good indicator of effective management of NEC skills which, in reality, is a fairly straightforward and simple process.

Question nineteen perhaps sums all questions and survey intent into a single distinct theme. The fact that over sixty percent of respondents, those on the receiving end of the NEC program, indicated a lack of confidence or satisfaction with Civil Engineer Corps management of NEC assignment and utilization process places the current management methodology in question. A ten, twenty, or even thirty percent negative response could perhaps be overlooked or treated as an indicator that the program requires some attention or revision. However, a sixty percent negative response indicates the program requires major changes in the fundamental way NEC holders are identified, trained, assigned, and utilized.

Table 6.8.2 provides a summary of utilization ratings given per NEC, listed in descending order of respondent indicators. For a detailed analysis of NMCB survey utilization responses categorized by NEC, refer to Appendix D.

Table 6.8.2 NEC Utilization Rating Summary

NEC	Title	NEC Utilization Rating			
		Primary	Secondary	Tertiary	Avg
5503	Adv Engineering Aid	10.00	10.00	N/A	10.00
5805	Adv Construction Mechanic	6.79	N/A	N/A	6.79
6021	Safety Inspector	6.85	5.00	8.00	6.62
5710	Adv Equipment Operator	7.38	5.80	N/A	6.59
5501	Construction Inspector	6.43	4.50	7.00	5.98
6010	Adv Steelworker	5.17	2.75	10.00	5.97
5635	Adv Construction Electrician	6.00	6.50	3.50	5.33
5915	Planner & Estimator	4.56	4.86	5.00	4.81
6105	Adv Utilitiesman	5.67	6.00	1.50	4.39
9502	Instructor	5.00	4.00	3.69	4.23
6104	Shore AC&R Technician	5.00	4.60	1.00	3.53
5907	Adv Builder	3.27	5.75	1.00	3.34
5708	Blaster	4.00	2.75	N/A	3.38
5644	Cable Splicing	4.00	2.00	N/A	3.00
5707	Water Well	1.50	4.40	2.00	2.63
5908	Tool & Equipment Technician	3.00	3.00	1.00	2.33

Very few of the NEC level utilization ratings exceed the seventy percent benchmark for effective management utilization of skills available. Upon averaging, the only NEC skill to surpass the benchmark is Advanced Engineering Aid, of which there are very few personnel that are traditionally in high demand. Most disturbing is the fact that a majority of NEC skills average a utilization rating of less than fifty percent, with over one third utilized at forty percent or less. The "placebo" Instructor NEC 9507, which is not a OF-13 related NEC and is not related to the OF-13 craft skills, scored higher in utilization than six construction craft related NECs.

Chapter Seven

Alternate Management Practices and Formats

7.1 Upper Management Education: The quickest and most easily facilitated solution to the underutilization of NEC skills in NMCBs is an improved NEC awareness on behalf of Civil Engineering Corps Officers responsible for the NEC program and the NEC Holder position assignment function.

- Background: CEC Officers serve two year tours in NMCBs. In that time, they may serve in a variety of roles, typically at least two per tour. Generally, an Officer serves at least half his or her tour in a staff position such as Training or Material Liaison, and the other half in a Company Commander or Detail Officer in Charge (OIC) position. In the latter, the Officer is directly responsible for staffing his internal organization, and must have an awareness of NEC skills in order to properly tailor his organization to his construction tasking. The Operations Officer, also serving a two year tour, is responsible for overseeing this process and ensuring the right NEC holders are placed in the proper job assignments. A CEC Officer will encounter a Battalion tour once every six to eight years, if fortunate. Therefore, most Officers can be assumed to be new to the NMCB environment and unfamiliar with many areas, especially a topic such as NEC skill capacity that is not readily evident and must be researched.

The Civil Engineering Corps Officer School (CECOS) located in Port Hueneme, Ca. conducts a two week SeaBee Indoctrination class for all Officers ordered to Battalions. In addition, CECOS conducts a two week prospective Operations Officer Indoctrination Class for Operations Officers ordered into Battalions. Per a phone conversation with LCDR Francis Castaldo, CEC, USN, Director of Military Readiness at CECOS, neither course addresses NECs or NEC management within Battalions. Therefore, the Officers in charge of management of

the NEC skill resource pool essentially are unprepared and ill equipped knowledgewise to undertake the management function that is their direct responsibility.

- Solution: Incorporate at least three hours of instruction on the NEC program in both the SeaBee and Operations Officer Indoctrination classes. The instruction should include a description of the various NECs in the NCF, the NEC skill requirement levels, the Detailing process, suggested Formal School selection criteria, and the guidelines or instructions mandating specific NECs for specific situations. Most importantly, Operations Officers, who are the governors of the position assignment and Battalion Formal School processes, must be made aware of and understand the management principles necessary to effectively utilize the skills at their disposal.
- Difficulty of Implementation: The educational change required for more effective NEC management could be very easily implemented. Development of course curricula and instructional material for both Indoctrination courses would not be complicated to produce or instruct. In addition, this change can be quickly implemented and roughly 85% of all Officers destined for Battalions are sent first to CECOS; thereby guaranteeing wide exposure to the proper audience.
- Negative Impacts: No negative impacts are noted.
- Positive Impacts:

1. Increased overall NEC program knowledge among CEC Officers responsible for direct management.
2. More effective placement of NEC Holders corresponding to increased management awareness.

7.2 Restrict OF-13 Personnel to Two NCF Related NECs: The restriction of the number of NECs allowable per OF-13 individual to two is a viable solution to the

overabundance of NEC skills onboard and the corresponding underutilization of the skill pool.

- Background: This concept parallels the Attainment process, which credits only the Primary and Secondary NECs held toward the Attainment and Strength of a given command. As mentioned in Chapter Four, the concept is not to spread an individual "too thin" by expecting he or she to perform more than two NEC functions at any given time or location. The concept could be applied to the permissible number of NECs as well. If an individual can not be expected to perform in more than two capacities, there is no point in awarding more than two OF-13 NECs. As an example, according to this standard, if one individual holds three NECs and another holds one, the maximum number of possible skills available is three. If each individual held two NECs, the maximum number of possible skills available reaches a total of four. This solution is also supported by the data presented in Chapter Five, in which Secondary NEC utilization ratings are significantly lower than Primary NEC utilization ratings; and Tertiary NEC utilization ratings hover in the twenty percent range.

- Solution: Through training related instructions such as the 1500.1A, Brigades and Regiments can administratively restrict NMCBs from sending personnel with two or more NCF related NECs to additional Formal Schools. Instruct Battalions to send personnel with no or one NEC to Formal Schools to meet attainment quotas as required. In addition, BUPERS can revise Detailing guidelines in the same fashion; although the majority of Tertiary NECs are a result of Battalion sponsored Formal Schools. As comparison, very few non OF-13 Ratings involve more than two NECs and multiple NEC holders are much less common.

- Difficulty of Implementation: Theoretically, this solution could be very easily implemented through administrative or procedural changes. In reality, implementation of this solution would be much more difficult. Historically, the number and diversity of NECs held has been used as a primary promotion indicator of

an individuals accomplishments and diversity of skills. Schools are traditionally awarded to top performers as a motivator to stay in the Navy and as complement for excellent job performance. The following promotion point for a First Class Petty Officer is advancement to Chief Petty Officer. A Chief Petty Officer is primarily an administrator or personnel supervisor and is not involved daily in the detailed technical field work that NECs are designed for. At most, a Chief would assume an advisory type of role. Therefore, leadership and management skills should assume priority over technical competence at the Chief Petty Officer promotion point. However, under the current promotion system, technical background and Formal Schools retain a majority role. In order for this solution to be successful, the "maximum of two" NEC concept would have to first be instilled in all upper level personnel and prior behavioral patterns and thought processes altered.

- Negative Impacts:

1. Implementation of this solution would naturally restrict the flexibility of personnel assignments within a NMCB. Instead of three or more possible job positions for one individual, the Operations Officer and Battalion Line Company Officers would be limited to two.

2. This option would certainly be met with negative attitudes throughout the NCF Enlisted community. NECs are a prized commodity for both in service time and later civilian pursuits, and restricting access to them would create a period of dissension to change; although in time the dissension would dissipate.

3. SeaBees are well known for their diversity of skills, which is a primary reason for the continued demand for their services. However, most of the diversity is achieved through cross-Rating on-the-job training and rarely through cross-Rating NEC schools.

- Positive Impacts:

1. If the wealth of NEC talent was more equally spread among all First Class Petty Officers, the total number of personnel available for assignment would increase; thereby possibly offsetting potential flexibility restrictions.

2. NEC Holders would be increasingly prone to assignment within Primary or Secondary NEC skills held, if fewer assignment options are available to management.

3. NEC skill proficiency should increase through more assignments to positions related to NECs held and corresponding increased craft production time.

7.3 Creation of Special NEC Staffs: The Naval Construction Brigades, through revisions of current organizational instructions, could mandate the modification of currently accepted organizational structures to incorporate NMCB Special Staffs in the areas, among others less critical, of Training, Planning and Estimating, Construction Inspection, and Safety.

- Background: Civilian construction firms incorporate staffs such as the aforementioned as part of the normal overhead operating manpower pool. Personnel are normally assigned to positions such as these full time and develop expertise in their career fields. NMCBs incorporate these construction project related staffs in a similar fashion; however, assignment to such a staff is normally restricted to a fourteen month forward deployment cycle. Personnel assigned are trained, fill the staff position for the deployment cycle, may or may not become fully proficient in the skill, and then are reassigned to other Battalion functions for the following deployment cycle where the NEC Skill again, may or may not be utilized.
- Solution: Mandate, through Brigade instructions or direction, that personnel Detailed, or "D'NECed" into a NMCB for a specific staff related NEC held, fill that specific NEC for the full NMCB tour of duty.

- Difficulty of Implementation: This NEC management principle could be readily implemented throughout all levels of the NCF structure. Revisions of current organizational guidelines and instructions at the Brigade level would force compliance at the Battalion level. Other NMCB non OF-13 aspects such as Supply, Medical, Disbursing, Personnel, and Administration are generally continuously staffed by the same personnel for the duration of their NMCB tour. This concept has been adopted in the specific area of Safety. Currently, upon reporting to a NMCB, a Chief (E7), is assigned as Safety Chief, trained, and assigned to and remains in the Safety Chief billet for the duration of his or her tour in an NMCB. This particular management measure, given recent emphasis placed on Safety, has proven successful. The concept could be expanded to the other overhead staffs in a similar fashion, although an expansional downgrade to incorporate Petty Officer First Class billets would be required. However, an administrative measure such as this would require a restructuring of the current NCF thought pattern, which incorporates diversity and a wide variety of skills held as an extremely important asset.

- Negative Impacts:

1. First Class Petty Officers assigned to a Staff position would not participate in actual "hands on" construction craft execution.

2. First Class Petty Officers may lose a competitive advantage for promotion if they appear less "well rounded" and more "focused" in a specific OF-13 related skill.

3. Lack of NMCB management assignment flexibility when manning organizations for a specific wartime or peacetime mission.

4. A Staff restricted by personnel capacity may not be able to respond to a sudden increase in tasking. As an example, a fixed Planning and Estimating Staff may not be capable of performing required tasking if a rapid deployment involving numerous construction projects was ordered.

Positive Impacts:

1. Full and complete utilization of the NEC skill for which the particular individual was trained and Detailed.

2. The development of craft "experts" above and beyond the NEC School skill level through increased and continuous craft exposure.

3. Reduction in NEC School required funding and training budgets.

4. Elimination of "learning curves" and periods of ineffectiveness experienced by Staffs upon assuming positions during each forward deployment reorganization.

7.4 Revision of Brigade Tasking Assignments to Battalions: Brigades, when undergoing the process of selecting construction projects for tasking to NMCBs for deployment execution, can alter project acceptance criteria or methodology to focus on construction tasking that may more fully exploit NEC Skills available.

- Background: As outlined in Chapter Three, Naval Construction Brigades are the entities that select from construction projects requested by theater Naval Activities and assign specific projects, or phases thereof, to NMCBs for execution while forwardly deployed. Traditionally, projects undertaken are fairly simple in nature and geared toward fundamental construction skills. This focus is completely in line with the NCF mission; that of low complexity construction in a contingency or wartime environment. Typical projects may involve the erection of a single story Pre-Engineered Building (PEB), construction of a road section or parking lot, interior remodeling or refinishing of an existing structure, or waterline or sewer line replacement. Complex projects of a large magnitude are rare, principally a result of reduced construction funding available throughout the Navy, and also a result of the fact that SeaBees perform peacetime construction tasking for training only. Civilian construction firms can be contracted to construct such projects much more rapidly

through a higher level of craft expertise and no project turnovers from Battalion to Battalion.

- Solution: Brigades may tailor deployment tasking to more complex and diverse projects that exercise the NEC resource skills that have been traditionally underutilized. Although this may be a "big picture" option, Brigades do not mandate how NEC holders are utilized at the Battalion level. NMCBs are still responsible for NEC holder assignment to projects tasked. This option will present more opportunity for management to employ NEC Holders, but will not force management to make NEC position assignments.
- Difficulty of Implementation: This alternative may be very easily implemented. The construction project selection and NMCB tasking administrative system has existed for numerous years. The same system may be employed, only with more attention to selection of more diverse projects that may more effectively tap the NEC resource pool also in existence.
- Negative Impacts: None noted.
- Positive Impacts:

1. Increased NEC utilization and proficiency through exposure to a more diverse construction environment focused on complex projects requiring NEC application.

7.5 Detailer Management of Position Assignments: As an expansion of the above management option, this solution would expand the realm of Detailer influence to incorporate specific job assignments within Battalions. For instance, a BU1 with NEC 5907 Advanced Builder could be Detailed to a Project Crewleader permanent assignment. Or, a NEC 5908 Tools and Equipment Specialist could be Detailed to a permanent assignment in the Central Tool Room. In essence, First Class Petty

Officers would spend a Battalion tour in the same job assignment for the duration; thereby ensuring NEC skills held would be fully utilized.

- Background: As mentioned in Chapter Four, Detailers manage numbers and quotas, not personnel. Once assigned to a command, the individual command may place a NEC Holder in a position or job assignment irregardless of his or her NEC. In addition, position assignments rotate every fourteen months with the establishment of new forward deployment organizations. An arrangement such as this would preclude the re-training and learning curves individuals undergo with each deployment reorganization and would further develop experts or specialists above and beyond the NEC training level through continuous experience. This arrangement would also parallel other Armed Forces, which have very specialized trades, and the civilian construction industry.

- Solution: From the Chief of Naval Operations level, direction to BUPERS to assume this mission and management function.

- Difficulty of Implementation: On the Battalion level, this solution would be extremely easy to implement. In fact, a large portion of the personnel reassignment and organizational shuffling burden would be eliminated. At the Detailer level, this solution would be extremely difficult to implement. BUPERS Detailers currently shoulder a very large administrative burden with their current mission. Expansion of the Detailing function to include specific Battalion position assignments would definitely increase the complexity of the Detailing process by an order of magnitude. This arrangement is not typical of current U.S. Navy Detailing practices, regardless of Rating.

- Negative Impacts:

1. Battalions would lose the ability to assign First Class Petty Officers when and where required or needed. A sub-standard performer Detailed to a specific position could not be removed and placed in a less damaging position.

2. Overall restriction in the development and exposure of First Class Petty Officers would result if individuals perform the same function for an entire tour. A large portion of the professional growth and talent in the First Class community evolves from rotational assignments to many varying and diverse positions. The development process is the key to forming a successful and adept Chief Petty Officer.

3. A Battalion requires First Class Petty Officers to manage non-construction activities such as Training, Drug and Alchohol Prevention, and Career Counseling. OF-13 personnel relegated to these assignments would forego an entire tour of NEC craft related construction activity.

4. BUPERS Detailers would be required to manage a much more complex and time involved Detailing process for which the organization is neither staffed or equipped.

- Positive Impacts (As in Option 7.3):

1. Full and complete utilization of the NEC skill for which the particular individual was trained and Detailed.

2. The development of craft "experts" above and beyond the NEC School skill level through increased and continuous craft exposure.

3. Reduction in NEC School required funding and training budgets.

4. Elimination of "learning curves" and periods of ineffectiveness experienced by Staffs upon assuming positions during each forward deployment reorganization.

7.6 NCF Reserve Tasking: Reduce or eliminate NEC skills not fully employed in active duty NMCBs and transfer tasking to U.S. Navy Reserve Battalions and Reserve NMCB Augment Units. Create, within Reserve Units, a cadre of OF-13 NEC Skill "specialists" who are employed in construction craft skills related to NECs

underutilized in the active duty NCF and designate these personnel for immediate activation if required.

- Background: As mentioned, the NCF is comprised of a Reserve element of equal comparison to the active duty capability. Many of the Reserve personnel are employed in the civilian construction industry and possess skills comparable to the active duty NEC holding personnel through normal employment and experience. Each NMCB, as part of the designed wartime structure, has a Reserve Augment Unit of roughly 140 personnel attached. In the event of a wartime deployment, the Augment Unit is activated and joins the NMCB to accomplish assigned construction tasking. Reserve Augment Unit personnel often are utilized during their two weeks of annual active duty requirement to assist and support forward deployment construction projects.

- Solution: Assign underutilized NECs, or a portion thereof, to Reserve Augment Units. This management option presents two potential challenges. First, although a Reserve individual may possess a NEC, the likelihood of skill proficiency is questionable as the NEC Skill Holder may or may not be employed in the NEC Skill held. Secondly, Reserve Augments may or may not be activated to reinforce a deployed Battalion depending on the particular contingency undertaking. However, the creation of a cadre of "NEC experts," those specifically employed in a civilian trade paralleling a particular NEC, can be identified and designated for immediate activation as required.

- Difficulty of Implementation: Again, a difficult solution to implement. The Reserve resource pool is rich in personnel with NEC Skills, many of which are more proficient and skilled than their active duty counterparts through civilian work experience. However, the NCF Reserve administrative system is not staffed or equipped to identify, segregate, and track Reserve NEC Holders with specialized skills. In addition, the Reserve skill pool is much more unstable relative to the active

duty side, as Reserve personnel may choose not to remain a part of the military and may seek alternate craft or career employment at any time. Furthermore, a Battalion can not readily reach into the Reserve pool to tap specific NEC assets at it's leisure; a significant amount of prior planning and administrative activity is required.

- Negative Impacts:

1. Reserve personnel are much less likely to receive or maintain a NEC Skill, as their active duty training time is limited, and their civilian occupation may not be related to the NEC Skill held or obtained.

2. Reserve Augment Units holding NEC Skills may not be activated in the event a wartime or contingency deployment is ordered.

3. Reserve personnel generally require a "readjustment period" to resume effective participation in the military lifestyle and mission.

4. Reserve personnel are often seen by their active duty counterparts as not fully effective, "up to speed," or part of the NCF construction team.

5. Reserve personnel are not always readily available or programmable to assist when specific NEC skills are required. In addition, if activated for specialized assistance, a Reservist period of activation may be limited.

6. NMCB difficulty in receiving NEC augmentation where and when required.

- Positive Impacts:

1. A reduction the amount of NEC management and training required on behalf of active duty Detailers and Battalions.

2. Specialized Staffs could be activated in whole or part to augment a particular active duty NMCB mission as required.

Chapter Eight
Conclusions

8.1 Summary: The data revealed by this study clearly indicates room for improvement in the management practices CEC Officers employ in capitalizing upon the vast and diverse NEC Skill Resource pool currently present in the Naval Construction Force. From the study and survey data, five key aspects of the NCF NEC program are readily visible:

- A degree of overtraining when considering actual U. S. Navy training and manning guidelines.
- Generally low utilization ratings for NEC skills held by NMCB First Class Petty Officers, and even lower indicators of NEC use while on Shore assignment. Also, there is a rapidly decreasing utilization rate for Secondary and Tertiary NECs held.
- Confusion on NEC School selection methodology or policy employed by CEC management.
- An overall lack of Petty Officer knowledge in the areas NEC Skill Assignment, Detailing, and NCF wide NEC skill levels.
- A sense of disenchantment with the level of effort and study CEC management places on NMCB position assignments with respect to NECs held; and a majority viewpoint against the current manner in which the overall NEC program operates.

BUPERS and EPMAC Personnel data from Chapter Four reveals the fourteen key NCF NECs are overtrained to a level of roughly 200 percent above the actual positions requiring the NEC skill. In addition, those 1,136 total positions are on average currently manned with the proper NEC Skill Holder at an 85 percent level, despite the ratio of three skillholders per skill requirement. As discussed, numerous factors such as Sea/Shore rotational cycles, individual needs and preferences, Detailer's needs and financial capacity, and NMCB NEC requirements effect the size

of the NEC resource pool and NEC training requirements. However, all factors considered, a training and resource pool level of two individuals per NEC skill requirement should be sufficient for NCF operations in today's essentially low threat of war environment. Chapter Four data additionally reveals that total NEC Holders in the four East Coast NMCBs average 280 percent of required ROC/POE NEC Skill Attainment levels. Therefore, in the NMCBs as well, roughly three NEC Skill holders are assigned for each NEC position requirement. If considering the derived training cost of $8,500 per NEC per student, the difference between a three to one and two to one NEC holder ratio sums to roughly $10,000,000 over the roughly twelve years required to develop the pool of respondents surveyed.

The survey response data analyzed in Chapter Six revealed several areas that deserve further attention on behalf of upper CEC management. The most prevalent are:

- BUPERS is responsible for only 60 percent of Primary and Secondary NEC Schools assigned, with NMCBs accounting for the remaining balance of 40 percent and 60 percent of all Tertiary NEC Schools assigned. While a NMCB Commanding Officer requires a degree of latitude in assigning individuals to NEC Schools in order to meet general shortfalls or contingencies, the author views the above figures as excessive. CEC Officers are often not familiar with the NEC concept and NCF wide NEC management. The experts at EPMAC and BUPERS should play a more dominant role.
- NMCBs should develop a formal written NEC School selection policy to eliminate the degree of confusion and apparent dissatisfaction with the NEC School selection process. Forty percent of respondents indicated feelings of management utilizing selection criteria that should not be part of the consideration. A simple Objectives Matrix using four or five key desired traits completed by an impartial panel could be an easy alternative.

- 50 percent of survey respondents indicated rarely utilizing NEC skills held while on shore assignment. This situation creates a loss of craft skill proficiency through dormancy that can only be remedied by aggressively pursuing challenging Shore Activity construction work and ensuring the First Class Petty Officer supervisory personnel are involved.
- Only 30 percent of First Class Petty Officers indicated that they were Detailed as a result of a NEC while 70 percent indicated they were not or did not know. This data is not a reflection of BUPERS Detailing practice and reveals an overall lack of NEC understanding at the E-6 level. This type of information should be incorporated into existing leadership classes to bring our front line leaders to a higher awareness of their own importance.
- Less than 60 percent of survey respondents indicated currently filling a Battalion position related to any NEC held, and less than 50 percent indicated they had ever filled a Battalion position specifically related to a NEC held. CEC management appears to not be placing individual E-6 NEC holders in positions capitalizing on skills held. Less than 40 percent of the respondents indicated satisfaction with the manner in which CEC management is operating the NEC program.
- The average utilization response for all NECs queried is 4.91 out of a possible 10. Only one NEC scored higher than a seven. The NCF appears to be operating at roughly 50 percent of capability and capacity.

8.2 Recommendations: Possible managerial and instructional changes that could potentially improve the utilization and management of the First Class Petty Officer NEC pool were outlined in Chapter Seven. To restate, they are:

1. Upper Management Education
2. Restriction to two OF-13 (NCF Related) NECs
3. Creation of NEC Special Staffs

4. Revision of Brigade Tasking Selection Criteria
5. Detailer Management of Position Assignments
6. Reserve NCF Tasking/Responsibility

All of the top four listed alternatives may be implemented with very little or no actual financial cost. Implementation for Upper CEC Management Education would involve only the preparation of basic instructional literature and instructional sessions incorporated in the two specific classes CEC Officers may possibly attend while assigned a SeaBee tour. Implementation of options two and three requires only the preparation and distribution of appropriate NCF Instructions. Option Four is administrative in nature; however, more complex. Naval Construction Brigades do not always retain the ability to choose specific construction projects that may improve utilization of poorly utilized NECs. Option Five is, with the current U. S. Navy organizational structure, realistically too difficult to implement. Option Six is a possibility; however, deemed by the author as not fully reliable in the event a rapid deployment is required.

The author recommends immediate implementation of Option One. CEC Officers should be made aware of numerous issues such as NEC Management that they are generally not exposed to. The author also recommends immediate implementation of Option Two. NMCBs are at Attainment levels two to three times the ROC/POE requirements and operating at 50% of skill capacity. Restriction to two OF-13 NECs will eventually reduce the additional training cost burden by $10 million, actually improve management's position assignment flexibility, and improve utilization through increased "hands-on" time with fewer people at the same workload. Option Four may be recommended as well. Naval Construction Brigades need only to be more acutely aware of NECs requiring "flexing" when assigning NMCB tasking.

Option Three, although paralleling a civilian construction firm organization, is not recommended at this time. The NCF retains an inherent need for flexibility in order to adapt and adjust to wartime or contingency tasking. The restriction of an individual to a staff may detract from overall flexibility, if or when required. Option Three is recommended for implementation in the event diminishing training budgets cannot support NEC training required to preclude this option.

Options Five and Six are not recommended at this point in time.

8.3 Increased Emphasis on NEC Management: A U. S. Navy Pick-Up Truck, referred to as a CUCV, costs the Navy from $15,000 to $20,000. The truck will receive a daily pre-start check by it's operator, a weekly spot check by the Dispatcher, and a monthly preventative maintenance visit to the shop. Instructions govern it's procurement, shipment, maintenance, condition requirements, repair parts storage needs, and restrict it's use to responsible individuals. If it is broken down, it is repaired as soon as parts are available. If it is not used sufficiently and does not register minimum operating hours, it is shipped somewhere else where it will be.

The NEC training cost of an average First Class Petty Officer NEC holder to the U. S. Navy is $17,000. No instructions govern, to any appreciable degree, his NEC track record or utilization. His NEC history will be noted when he reports for duty, and then generally will not be looked at again. He does not receive any periodic check or review to determine his NEC condition skillwise. If he is not used sufficiently, he stays right where he is and continues on until a new forward deployment re-organization comes along.

The recent push in the Navy is "Take care of Your People, They are Your Best Asset." From a strictly construction craft related viewpoint, the NCF appears to be placing more emphasis on an equipment asset, as compared to an equally priced human asset. More recent attention is being directed towards utilizing CEC and NCF

assets in the most effective and economic manner, especially in light of recent military downsizing. The NEC Resource pool is certainly one of those assets. More emphasis must be placed on NEC Resource pool management. Financial savings, as well as improvements in the "People" factors of motivation, satisfaction, productivity, and human relations associated with construction craft workers may be realized.

Copies of or information regarding this thesis may be obtained at the following locations:

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Appendix A

NEC Skill Descriptions

Appendix A

NEC Skill Descriptions

Engineering Aid (EA)

EA-5501 Advanced Engineering Aid: Employs the principles and techniques of foremanship. Solves mathematical problems commonly encountered by personnel in the Engineering Aid Rating. Designs paved highway, computes optimum runway orientation, adjusts a quadrilateral triangulation system and computes the coordinates of each station. Estimates the material requirements for, plans, and schedules the construction of, an advanced base administration building using the Network Analysis system concept. Explores, identifies, classifies, and stabilizes soils. Identifies and test bituminous paving mixes. Designs a concrete mix, tests mix ingredients, tests the wet mix, and performs both flexural and compressive strength tests upon the cured mix

Sequence Code: 3 Billet Paygrade: E5-E6 Personnel Paygrade: E5-E6

Construction Electrician (CE)

CE-5635 Advanced Construction Electrician: Employs the principles and techniques of foremanship. Applies advanced principles of electrical theory. Plans and troubleshoots to a component level. Installs and maintains an airfield lighting system and electrical transmission system. Operates and maintains electrical power plants. Must be familiar with the fundamentals of solid state circuitry. Locates faults in cables and splices them. Operates and maintains interoffice communications systems, local and common battery telephone systems, and switchboards. Plans and installs interior wiring and lighting systems.

Sequence Code: 3 Billet Paygrade: E5-E6 Personnel Paygrade: E5-E6

CE-5644 Cable Splicing Technician: Reads and interprets manufacturer's drawings to splice and terminate single and multiple conductor cables used in high voltage distribution systems. Reads and interprets manufacturer's drawings to splice and terminate cables using copper and fiber optic technology. Uses test equipment to locate faults and splice losses in power and communication cables and splices.
Sequence Code: 6 Billet Paygrade: E5-E6 Personnel Paygrade: E5-E6

CE-5601 Uninterruptible Power Supply (UPS) Maintenance
CE-5633 Mobile Utilities Support Equipment (MUSE) Technician
CE-5642 Central Office Exchange Technician

NECs 5601, 5633 and 5642 are rare, specialized NECs utilized primarily at specific shore establishments. Although an individual may hold one or more of these NECs, they are generally not required in a NMCB and will not be studied.

Equipment Operator (EO)
EO-5707 Water Well Drilling Technician: Determines the geographical area most suitable for developing a water supply. Sets up and operates well drilling machine (rotary, rotary/pneumatic an/or percussion) rig to drill water wells. Hoists tubular casing and drill steel making necessary connections. Manipulates levers to control drill and drive casing. Operates drilling rig using drilling fluids as required. Removes samples of subterrain. Develops the water supply, tests water for purity and the well for yield and draw down
Sequence Code: 4 Billet Paygrade: E5-E8 Personnel Paygrade: E5-E8

EO-5708 Blaster: Places and detonates charges to clear sites, excavate or obtain raw materials for rock crushers, and/or develops rock quarries. Transfers explosives from

magazine to blasting area. Exercises specified safety precautions. Bores holes, notes soil formation, and determines amount of explosives required. Explodes charge by fuse or electrically. Oversees stowage of explosives in magazine. Maintains record of explosives expended and in stock.

Sequence Code: 4 Billet Paygrade: E5-E7 Personnel Paygrade: E5-E7

EO-5710 Advanced Equipment Operator: Employs the principles and techniques of foremanship. Solves basic mathematics problems related to earthwork production and equipment effectiveness. Applies advanced principles of earthwork. Applies advanced principles of asphalt mixing and paving, and techniques of increasing production rate. Operates, adjusts, and services cranes with attachments. Operates, adjusts, and services crawler and wheel tractors with attachments and scrapers. Operates, adjusts, and services ditchers, motorized graders and road rollers. Operates, adjusts, and services rock crushers

Sequence Code: 3 Billet Paygrade: E5-E6 Personnel Paygrade: E5-E6

EO-5712 Elevated Causeway System (Modular) Specialist: EO-5712 is not applicable to a NMCB and will not be considered.

Construction Mechanic (CM)

CM-5805 Advanced Construction Mechanic: Employs the principles and techniques of foremanship. Troubleshoots, overhauls, and maintains gasoline and diesel engines. Troubleshoots, overhauls, and maintains equipment power trains, chassis, and component assemblies. Reconditions hydraulic valves and cylinders. Analyzes and tests electrical and fuel injection systems utilizing appropriate test equipment.

Sequence Code: 3 Billet Paygrade: E4-E6 Personnel Paygrade: E4-E6

Builder (BU)

BU-5907 Advanced Builder: Employs the principles and techniques of foremanship. Mixes, places, finishes, and cures concrete. Constructs forms for concrete construction. Performs masonry construction. Frames floors, walls, stairs, and roofs. Erects waterfront, heavy timber and advanced base structures, and operates and maintains shop tools and equipment. These tools include saws, sanders, planers, routers, drills, and other millworking tools.

Sequence Code: 3 Billet Paygrade: E5-E6 Personnel Paygrade: E5-E6

BU-5908 Tool and Equipment Technician: Installs and performs organizational and or intermediate level maintenance on building trades shop equipment. Maintains and repairs portable, powered handtools associated with construction skills. Gums, sharpens, and sets saw blades. Splices band saw blades. Grinds and sharpens cutting tools. Maintains files of manufacturer's maintenance and spare parts list. Coordinates stocking and procurement of parts. Establishes preventative maintenance schedules. Records data on major repairs.

Sequence Code: 6 Billet Paygrade: E5-E6 Personnel Paygrade: E5-E6

BU-5931 Advanced Underwater Construction Technician

BU-5932 Basic Underwater Construction Technician

BU-5933 Basic Underwater Construction Technician Candidate

These NECs area oriented towards Underwater Construction Teams (UCT), are not applicable to a NMCB, and will not be considered.

Steel Worker (SW)

SW-6010 Advanced Steelworker: Employs the principles and techniques of foremanship, job planning, job control elements, and the responsibilities for safety. Works basic mathematical problems involving sheetmetal layout, strength of wire rope and fiber line. Repairs welding equipment, welds ferrous and non-ferrous metals, wrinkle bends pipe, lays out, and prepares pipe joints to be welded in the vertical and overhead positions. GMA/GTA welds non-ferrous metals in the flat position. Knows the nomenclature of pontoons, butler buildings, steel towers, bolted steel tanks, and AM-2 aluminum airfield mats. Knows the procedures of assembly and disassembly of steel structures. Performs practical work in the field under supervision, estimates, and plans minor jobs as to material and personnel. Lays out and splices wire rope and applies wire rope attachments and lays out and fabricates sheetmetal parts and joins the parts by riveting, soldering, spotwelding, or seaming.

Sequence Code: 3 Billet Paygrade: E5-E6 Personnel Paygrade: E5-E6

Utilitiesman (UT)

UT-6104 Shore Based Refrigeration and Air Conditioning Technician: Installs, operates, and performs organizational and/or intermediate level maintenance on refrigeration, air conditioning, water cooling equipment, cube and flake ice machines, and block ice manufacturing plants. Performs refrigerant recovery and recycling in accordance with section 608 of the Clean Air Act, as amended. Type I and II certification, in accordance with EPA mandate, is required.

Sequence Code: 4 Billet Paygrade: E5-E6 Personnel Paygrade: E5-E6

UT-6105 Advanced Utilitiesman: Employs the principles and techniques of foremanship. Operates water treatment equipment, water supply, and sewage treatment equipment. Installs water distribution ans sewage systems. Operates and maintains boilers, air conditioning, and refrigeration equipment. Determines efficient

crew sizes and equipment and material requirements. Prepares a critical path schedule and arrow design.

Sequence Code: 3 Billet Paygrade: E5-E6 Personnel Paygrade: E5-E6

Open Rating NECs

EA-5501 Construction Inspector: Reviews and analyzes project construction drawings and specifications and prepares a Construction Inspection Plan including a checklist of inspection points along critical phases of construction and installation. Verifies that all materials and/or equipment ordered meet applicable project specifications and certifies their conformance to specifications upon receipt. Inspects all phases of construction and installation, including civil, architectural and structural, electrical and mechanical, for compliance with drawings, specifications, and acceptable safe operating, installation, and construction practices. Schedules, coordinates, and observes tests on mechanical and electrical systems and arranges for quality control tests on such items as sub-base materials, aggregates and cementious binders and on related mixes before, during, and after installation. Prepares logs, records and reports on all inspections and tests.

Sequence Code: 3 Billet Paygrade: E5-E6 Personnel Paygrade: E5-E6

Source Rating: EA BU CE EO SW UT

BU-5915 Construction Planner and Estimator Specialist: Plans and estimates material, manpower, and equipment requirements for various construction jobs. Performs scheduling, procurement, production control, and management reporting of construction projects.

Sequence Code: 3 Billet Paygrade: E5-E6 Personnel Paygrade: E5-E6

Source Rating: BU CE EO SW UT

SW-6021 Safety Inspector: Organizes and directs the operation of the safety department. Investigates accidents, analyzes accidents and problem areas, and recommends methods to decrease frequency and/or eliminate accidents. Collects data to ascertain accident trends. Inspects project sites, grounds, buildings, and machinery to isolate hazards to life, health, and equipment. Conducts safety education campaigns by preparing and/or distributing literature, posters, charts, and displays. Organizes and directs safety committee. Directs placement of traffic control signs and devices.
Sequence Code: 2 Billet Paygrade: E6-E8 Personnel Paygrade: E6-E8
Source Rating: BU CE EO SW UT CM EA

XX-9502 Instructor: Instructors compile information, organize class curricula, prepare lesson plans and lectures, and teach "A," SCBT, and Formal Schools. This particular NEC is not critical to NMCBs, however, it will be considered in the study as a "Placebo" NEC for the reason that it is a widely held skill applicable for utilization in internally conducted Battalion craft training.
Sequence Code: 2 Billet Paygrade: E5-E6 Personnel Paygrade: E5-E6
Source Rating: BU CE EO SW UT CM EA

Appendix B
NEC Attainment Analysis

NEC 5503: Advanced Engineering Aid

NMCB 1									Actual Strength
	ROC/POE	Primary	Secondary	Total	Attainment	Tertiary	Other	Total	
	2				250.00%				250.00%
E6		2	0	2		0	0	2	
E5		3	0	3		0	0	3	
Other		0	0	0		0	0	0	
				5				5	

NMCB 7									Actual Strength
	ROC/POE	Primary	Secondary	Total	Attainment	Tertiary	Other	Total	
	2				200.00%				200.00%
E6		1	1	2		0	0	2	
E5		2	0	2		0	0	2	
Other		0	0	0		0	0	0	
				4				4	

NMCB 74									Actual Strength
	ROC/POE	Primary	Secondary	Total	Attainment	Tertiary	Other	Total	
	2				50.00%				50.00%
E6		0	0	0		0	0	0	
E5		1	0	1		0	0	1	
Other		0	0	0		0	0	0	
				1				1	

NMCB 133									Actual Strength
	ROC/POE	Primary	Secondary	Total	Attainment	Tertiary	Other	Total	
	2				250.00%				250.00%
E6		1	1	2		0	0	2	
E5		3	0	3		0	0	3	
Other		0	0	0		0	0	0	
				5				5	

Cumulative									Actual Strength
	ROC/POE	Primary	Secondary	Total	Attainment	Tertiary	Other	Total	
	8				187.50%				187.50%
E6		4	2	6		0	0	6	
E5		9	0	9		0	0	9	
Other		0	0	0		0	0	0	
				15				15	

NEC 5635: Advanced Construction Electrician

NMCB 1	ROC/POE	Primary	Secondary	Total	Attainment	Tertiary	Other	Total	Actual Strength
	6				166.67%				166.67%
E6		5	1	6		0	0	6	
E5		4	0	4		0	0	4	
Other		0	0	0		0	0	0	
				10				10	

NMCB 7	ROC/POE	Primary	Secondary	Total	Attainment	Tertiary	Other	Total	Actual Strength
	6				216.67%				216.67%
E6		4	1	5		0	0	5	
E5		8	0	8		0	0	8	
Other		0	0	0		0	0	0	
				13				13	

NMCB 74	ROC/POE	Primary	Secondary	Total	Attainment	Tertiary	Other	Total	Actual Strength
	6				100.00%				116.67%
E6		5	0	5		1	0	6	
E5		1	0	1		0	0	1	
Other		0	0	0		0	0	0	
				6				7	

NMCB 133	ROC/POE	Primary	Secondary	Total	Attainment	Tertiary	Other	Total	Actual Strength
	6				166.67%				183.33%
E6		2	2	4		1	0	5	
E5		6	0	6		0	0	6	
Other		0	0	0		0	0	0	
				10				11	

Cumulative	ROC/POE	Primary	Secondary	Total	Attainment	Tertiary	Other	Total	Actual Strength
	24				162.50%				170.83%
E6		16	4	20		2	0	22	
E5		19	0	19		0	0	19	
Other		0	0	0		0	0	0	
				39				41	

NEC 5644: Cable Splicing Technician

NMCB 1								Actual
	ROC/POE	Primary	Secondary	Total	Attainment	Tertiary	Other	Total	Strength
	3				266.67%				333.33%
E6		1	3	4		1	0	5	
E5		1	2	3		1	0	4	
Other		1	0	1		0	0	1	
				8				10	

NMCB 7								Actual
	ROC/POE	Primary	Secondary	Total	Attainment	Tertiary	Other	Total	Strength
	3				333.33%				366.67%
E6		0	3	3		1	0	4	
E5		2	5	7		0	0	7	
Other		0	0	0		0	0	0	
				10				11	

NMCB 74								Actual
	ROC/POE	Primary	Secondary	Total	Attainment	Tertiary	Other	Total	Strength
	3				200.00%				233.33%
E6		0	3	3		1	0	4	
E5		2	1	3		0	0	3	
Other		0	0	0		0	0	0	
				6				7	

NMCB 133								Actual
	ROC/POE	Primary	Secondary	Total	Attainment	Tertiary	Other	Total	Strength
	3				33.33%				133.33%
E6		0	1	1		2	1	4	
E5		0	0	0		0	0	0	
Other		0	0	0		0	0	0	
				1				4	

Cumulative								Actual
	ROC/POE	Primary	Secondary	Total	Attainment	Tertiary	Other	Total	Strength
	12				208.33%				266.67%
E6		1	10	11		5	1	17	
E5		5	8	13		1	0	14	
Other		1	0	1		0	0	1	
				25				32	

NEC 5707: Water Well Drilling Technician

NMCB 1	ROC/POE	Primary	Secondary	Total	Attainment	Tertiary	Other	Total	Actual Strength
	5				100.00%				120.00%
E8		0	0	0		0	0	0	
E7		1	1	2		0	0	2	
E6		0	2	2		0	0	2	
E5		0	1	1		1	0	2	
Other		0	0	0		0	0	0	
				5				6	

NMCB 7	ROC/POE	Primary	Secondary	Total	Attainment	Tertiary	Other	Total	Actual Strength
	5				140.00%				200.00%
E8		0	0	0		0	0	0	
E7		0	0	0		0	0	0	
E6		3	2	5		2	1	8	
E5		1	1	2		0	0	2	
Other		0	0	0		0	0	0	
				7				10	

NMCB 74	ROC/POE	Primary	Secondary	Total	Attainment	Tertiary	Other	Total	Actual Strength
	5				100.00%				120.00%
E8		0	0	0		0	0	0	
E7		1	0	1		1	0	2	
E6		0	3	3		0	0	3	
E5		1	0	1		0	0	1	
Other		0	0	0		0	0	0	
				5				6	

NMCB 133	ROC/POE	Primary	Secondary	Total	Attainment	Tertiary	Other	Total	Actual Strength
	5				140.00%				180.00%
E8		0	0	0		0	0	0	
E7		1	0	1		1	0	2	
E6		2	3	5		1	0	6	
E5		0	1	1		0	0	1	
Other		0	0	0		0	0	0	
				7				9	

Cumulative	ROC/POE	Primary	Secondary	Total	Attainment	Tertiary	Other	Total	Actual Strength
	20				120.00%				155.00%
E8		0	0	0		0	0	0	
E7		3	1	4		2	0	6	
E6		5	10	15		3	1	19	
E5		2	3	5		1	0	6	
Other		0	0	0		0	0	0	
				24				31	

NEC 5708: Blaster

NMCB 1									Actual
	ROC/POE	Primary	Secondary	Total	Attainment	Tertiary	Other	Total	Strength
	4				150.00%				150.00%
E7		2	0	2		0	0	2	
E6		1	0	1		0	0	1	
E5		2	1	3		0	0	3	
Other		0	0	0		0	0	0	
				6				6	

NMCB 7									Actual
	ROC/POE	Primary	Secondary	Total	Attainment	Tertiary	Other	Total	Strength
	4				200.00%				250.00%
E7		1	1	2		0	0	2	
E6		1	3	4		2	0	6	
E5		0	2	2		0	0	2	
Other		0	0	0		0	0	0	
				8				10	

NMCB 74									Actual
	ROC/POE	Primary	Secondary	Total	Attainment	Tertiary	Other	Total	Strength
	4				100.00%				125.00%
E7		0	2	2		1	0	3	
E6		1	0	1		0	0	1	
E5		0	1	1		0	0	1	
Other		0	0	0		0	0	0	
				4				5	

NMCB 133									Actual
	ROC/POE	Primary	Secondary	Total	Attainment	Tertiary	Other	Total	Strength
	4				175.00%				200.00%
E7		1	1	2		0	0	2	
E6		0	3	3		1	0	4	
E5		1	1	2		0	0	2	
Other		0	0	0		0	0	0	
				7				8	

Cumulative									Actual
	ROC/POE	Primary	Secondary	Total	Attainment	Tertiary	Other	Total	Strength
	16				156.25%				181.25%
E7		4	4	8		1	0	9	
E6		3	6	9		3	0	12	
E5		3	5	8		0	0	8	
Other		0	0	0		0	0	0	
				25				29	

NEC 5710: Advanced Equipment Operator

NMCB 1	ROC/POE	Primary	Secondary	Total	Attainment	Tertiary	Other	Total	Actual Strength
	8				187.50%				212.50%
E6		9	1	10		1	1	12	
E5		4	1	5		0	0	5	
Other		0	0	0		0	0	0	
				15				17	

NMCB 7	ROC/POE	Primary	Secondary	Total	Attainment	Tertiary	Other	Total	Actual Strength
	8				200.00%				200.00%
E6		8	4	12		0	0	12	
E5		4	0	4		0	0	4	
Other		0	0	0		0	0	0	
				16				16	

NMCB 74	ROC/POE	Primary	Secondary	Total	Attainment	Tertiary	Other	Total	Actual Strength
	8				100.00%				112.50%
E6		6	0	6		1	0	7	
E5		2	0	2		0	0	2	
Other		0	0	0		0	0	0	
				8				9	

NMCB 133	ROC/POE	Primary	Secondary	Total	Attainment	Tertiary	Other	Total	Actual Strength
	8				300.00%				312.50%
E6		12	4	16		1	0	17	
E5		8	0	8		0	0	8	
Other		0	0	0		0	0	0	
				24				25	

Cumulative	ROC/POE	Primary	Secondary	Total	Attainment	Tertiary	Other	Total	Actual Strength
	32				196.88%				209.38%
E6		35	9	44		3	1	48	
E5		18	1	19		0	0	19	
Other		0	0	0		0	0	0	
				63				67	

NEC 5805: Advanced Construction Mechanic

NMCB 1

ROC/POE	Primary	Secondary	Total	Attainment	Tertiary	Other	Total	Actual Strength
5				360.00%				360.00%
E6	12	0	12		0	0	12	
E5	6	0	6		0	0	6	
Other	0	0	0		0	0	0	
			18				18	

NMCB 7

ROC/POE	Primary	Secondary	Total	Attainment	Tertiary	Other	Total	Actual Strength
5				300.00%				300.00%
E6	8	0	8		0	0	8	
E5	7	0	7		0	0	7	
Other	0	0	0		0	0	0	
			15				15	

NMCB 74

ROC/POE	Primary	Secondary	Total	Attainment	Tertiary	Other	Total	Actual Strength
5				280.00%				280.00%
E6	7	0	7		0	0	7	
E5	7	0	7		0	0	7	
Other	0	0	0		0	0	0	
			14				14	

NMCB 133

ROC/POE	Primary	Secondary	Total	Attainment	Tertiary	Other	Total	Actual Strength
5				300.00%				300.00%
E6	10	0	10		0	0	10	
E5	5	0	5		0	0	5	
Other	0	0	0		0	0	0	
			15				15	

Cumulative

ROC/POE	Primary	Secondary	Total	Attainment	Tertiary	Other	Total	Actual Strength
20				310.00%				310.00%
E6	37	0	37		0	0	37	
E5	25	0	25		0	0	25	
Other	0	0	0		0	0	0	
			62				62	

NEC 5907: Advanced Builder

NMCB 1	ROC/POE	Primary	Secondary	Total	Attainment	Tertiary	Other	Total	Actual Strength
	12				241.67%				241.67%
E6		13	7	20		0	0	20	
E5		7	2	9		0	0	9	
Other		0	0	0		0	0	0	
				29				29	

NMCB 7	ROC/POE	Primary	Secondary	Total	Attainment	Tertiary	Other	Total	Actual Strength
	12				241.67%				250.00%
E6		14	5	19		0	1	20	
E5		8	2	10		0	0	10	
Other		0	0	0		0	0	0	
				29				30	

NMCB 74	ROC/POE	Primary	Secondary	Total	Attainment	Tertiary	Other	Total	Actual Strength
	12				133.33%				150.00%
E6		11	1	12	200.00%	2	0	14	
E5		3	1	4		0	0	4	
Other		0	0	0		0	0	0	
				16				18	

NMCB 133	ROC/POE	Primary	Secondary	Total	Attainment	Tertiary	Other	Total	Actual Strength
	12				158.33%				191.67%
E6		5	9	14		4	0	18	
E5		2	3	5		0	0	5	
Other		0	0	0		0	0	0	
				19				23	

Cumulative	ROC/POE	Primary	Secondary	Total	Attainment	Tertiary	Other	Total	Actual Strength
	48				193.75%				208.33%
E6		43	22	65		6	1	72	
E5		20	8	28		0	0	28	
Other		0	0	0		0	0	0	
				93				100	

NEC 5908: Tool & Equipment Technician

NMCB 1	ROC/POE	Primary	Secondary	Total	Attainment	Tertiary	Other	Total	Actual Strength
	2				250.00%				350.00%
E6		1	1	2		2	0	4	
E5		2	1	3		0	0	3	
Other		0	0	0		0	0	0	
				5				7	

NMCB 7	ROC/POE	Primary	Secondary	Total	Attainment	Tertiary	Other	Total	Actual Strength
	2				150.00%				250.00%
E6		0	2	2		2	0	4	
E5		1	0	1		0	0	1	
Other		0	0	0		0	0	0	
				3				5	

NMCB 74	ROC/POE	Primary	Secondary	Total	Attainment	Tertiary	Other	Total	Actual Strength
	2				150.00%				150.00%
E6		0	3	3		0	0	3	
E5		0	0	0		0	0	0	
Other		0	0	0		0	0	0	
				3				3	

NMCB 133	ROC/POE	Primary	Secondary	Total	Attainment	Tertiary	Other	Total	Actual Strength
	2				200.00%				300.00%
E6		1	2	3		1	1	5	
E5		1	0	1		0	0	1	
Other		0	0	0		0	0	0	
				4				6	

Cumulative	ROC/POE	Primary	Secondary	Total	Attainment	Tertiary	Other	Total	Actual Strength
	8				187.50%				262.50%
E6		2	8	10		5	1	16	
E5		4	1	5		0	0	5	
Other		0	0	0		0	0	0	
				15				21	

NEC 6010: Advanced Steelworker

NMCB 1								Actual
	ROC/POE	Primary	Secondary	Total	Attainment	Tertiary	Other	Total	Strength
	4				225.00%				225.00%
E6		3	2	5		0	0	5	
E5		3	0	3		0	0	3	
Other		1	0	1		0	0	1	
				9				9	

NMCB 7								Actual
	ROC/POE	Primary	Secondary	Total	Attainment	Tertiary	Other	Total	Strength
	4				300.00%				325.00%
E6		3	3	6		0	1	7	
E5		6	0	6		0	0	6	
Other		0	0	0		0	0	0	
				12				13	

NMCB 74								Actual
	ROC/POE	Primary	Secondary	Total	Attainment	Tertiary	Other	Total	Strength
	4				225.00%				275.00%
E6		1	2	3		2	0	5	
E5		6	0	6		0	0	6	
Other		0	0	0		0	0	0	
				9				11	

NMCB 133								Actual
	ROC/POE	Primary	Secondary	Total	Attainment	Tertiary	Other	Total	Strength
	4				175.00%				250.00%
E6		0	2	2		3	0	5	
E5		5	0	5		0	0	5	
Other		0	0	0		0	0	0	
				7				10	

Cumulative								Actual
	ROC/POE	Primary	Secondary	Total	Attainment	Tertiary	Other	Total	Strength
	16				231.25%				268.75%
E6		7	9	16		5	1	22	
E5		20	0	20		0	0	20	
Other		1	0	1		0	0	1	
				37				43	

NEC 6104: Shore Based Refrigeration & Air Conditioning Technician

NMCB 1								Actual
	ROC/POE	Primary	Secondary	Total	Attainment	Tertiary	Other	Total	Strength
	6				166.67%				166.67%
E6		5	1	6		0	0	6	
E5		4	0	4		0	0	4	
Other		0	0	0		0	0	0	
				10				10	

NMCB 7								Actual
	ROC/POE	Primary	Secondary	Total	Attainment	Tertiary	Other	Total	Strength
	6				216.67%				216.67%
E6		4	1	5		0	0	5	
E5		8	0	8		0	0	8	
Other		0	0	0		0	0	0	
				13				13	

NMCB 74								Actual
	ROC/POE	Primary	Secondary	Total	Attainment	Tertiary	Other	Total	Strength
	6				100.00%				116.67%
E6		5	0	5		1	0	6	
E5		1	0	1		0	0	1	
Other		0	0	0		0	0	0	
				6				7	

NMCB 133								Actual
	ROC/POE	Primary	Secondary	Total	Attainment	Tertiary	Other	Total	Strength
	6				166.67%				183.33%
E6		2	2	4		1	0	5	
E5		6	0	6		0	0	6	
Other		0	0	0		0	0	0	
				10				11	

Cumulative								Actual
	ROC/POE	Primary	Secondary	Total	Attainment	Tertiary	Other	Total	Strength
	24				162.50%				170.83%
E6		16	4	20		2	0	22	
E5		19	0	19		0	0	19	
Other		0	0	0		0	0	0	
				39				41	

NEC 6105: Advanced Utilitiesman

NMCB 1	ROC/POE	Primary	Secondary	Total	Attainment	Tertiary	Other	Total	Actual Strength
	4				100.00%				100.00%
E6		2	2	4		0	0	4	
E5		0	0	0		0	0	0	
Other		0	0	0		0	0	0	
				4				4	

NMCB 7	ROC/POE	Primary	Secondary	Total	Attainment	Tertiary	Other	Total	Actual Strength
	4				100.00%				125.00%
E6		1	1	2		1	0	3	
E5		1	1	2		0	0	2	
Other		0	0	0		0	0	0	
				4				5	

NMCB 74	ROC/POE	Primary	Secondary	Total	Attainment	Tertiary	Other	Total	Actual Strength
	4				50.00%				50.00%
E6		0	1	1		0	0	1	
E5		1	0	1		0	0	1	
Other		0	0	0		0	0	0	
				2				2	

NMCB 133	ROC/POE	Primary	Secondary	Total	Attainment	Tertiary	Other	Total	Actual Strength
	4				225.00%				225.00%
E6		0	4	4		0	0	4	
E5		3	2	5		0	0	5	
Other		0	0	0		0	0	0	
				9				9	

Cumulative	ROC/POE	Primary	Secondary	Total	Attainment	Tertiary	Other	Total	Actual Strength
	16				118.75%				125.00%
E6		3	8	11		1	0	12	
E5		5	3	8		0	0	8	
Other		0	0	0		0	0	0	
				19				20	

NEC 5501: Construction Inspector

NMCB 1									Actual
	ROC/POE	Primary	Secondary	Total	Attainment	Tertiary	Other	Total	Strength
	6				283.33%				283.33%
E7		7	1	8		0	0	8	
E6		8	1	9		0	0	9	
E5		0	0	0		0	0	0	
Other		0	0	0		0	0	0	
				17				17	

NMCB 7									Actual
	ROC/POE	Primary	Secondary	Total	Attainment	Tertiary	Other	Total	Strength
	6				350.00%				383.33%
E7		7	1	8		0	0	8	
E6		11	2	13		2	0	15	
E5		0	0	0		0	0	0	
Other		0	0	0		0	0	0	
				21				23	

NMCB 74									Actual
	ROC/POE	Primary	Secondary	Total	Attainment	Tertiary	Other	Total	Strength
	6				333.33%				333.33%
E7		1	2	3		0	0	3	
E6		9	8	17		0	0	17	
E5		0	0	0		0	0	0	
Other		0	0	0		0	0	0	
				20				20	

NMCB 133									Actual
	ROC/POE	Primary	Secondary	Total	Attainment	Tertiary	Other	Total	Strength
	6				416.67%				416.67%
E7		7	2	9		0	0	9	
E6		13	3	16		0	0	16	
E5		0	0	0		0	0	0	
Other		0	0	0		0	0	0	
				25				25	

Cumulative									Actual
	ROC/POE	Primary	Secondary	Total	Attainment	Tertiary	Other	Total	Strength
	24				345.83%				354.17%
E7		22	6	28		0	0	28	
E6		41	14	55		2	0	57	
E5		0	0	0		0	0	0	
Other		0	0	0		0	0	0	
				83				85	

Rate	BU	CE	CM	EA	EO	SW	UT	Total
Response	34	10	0	2	10	15	14	85
% Response	40%	12%	0%	2%	12%	18%	16%	100%

NEC 5915: Construction Planner & Estimator Specialist

NMCB 1								Actual
	ROC/POE	Primary	Secondary	Total	Attainment	Tertiary	Other	Total	Strength
	7				242.86%				271.43%
E6		6	5	11		2	0	13	
E5		4	2	6		0	0	6	
Other		0	0	0		0	0	0	
				17				19	

NMCB 7								Actual
	ROC/POE	Primary	Secondary	Total	Attainment	Tertiary	Other	Total	Strength
	7				171.43%				200.00%
E6		6	3	9		2	0	11	
E5		3	0	3		0	0	3	
Other		0	0	0		0	0	0	
				12				14	

NMCB 74								Actual
	ROC/POE	Primary	Secondary	Total	Attainment	Tertiary	Other	Total	Strength
	7				171.43%				185.71%
E6		9	1	10		0	1	11	
E5		1	1	2		0	0	2	
Other		0	0	0		0	0	0	
				12				13	

NMCB 133								Actual
	ROC/POE	Primary	Secondary	Total	Attainment	Tertiary	Other	Total	Strength
	7				200.00%				200.00%
E6		8	4	12		0	0	12	
E5		2	0	2		0	0	2	
Other		0	0	0		0	0	0	
				14				14	

Cumulative								Actual
	ROC/POE	Primary	Secondary	Total	Attainment	Tertiary	Other	Total	Strength
	28				196.43%				214.29%
E6		29	13	42		4	1	47	
E5		10	3	13		0	0	13	
Other		0	0	0		0	0	0	
				55				60	

Rate	BU	CE	CM	EA	EO	SW	UT	Total
Response	35	6	0	1	8	6	4	60
% Response	58%	10%	0%	2%	13%	10%	7%	100%

NEC 6021: Safety Inspector

NMCB 1								Actual
	ROC/POE	Primary	Secondary	Total	Attainment	Tertiary	Other	Total	Strength
	2				550.00%				550.00%
E8		1	0	1		0	0	1	
E7		2	0	2		0	0	2	
E6		6	0	6		0	0	6	
Other		2	0	2		0	0	2	
				11				11	

NMCB 7								Actual
	ROC/POE	Primary	Secondary	Total	Attainment	Tertiary	Other	Total	Strength
	2				1100.00%				1100.00%
E8		1	0	1		0	0	1	
E7		6	0	6		0	0	6	
E6		12	0	12		0	0	12	
Other		3	0	3		0	0	3	
				22				22	

NMCB 74								Actual
	ROC/POE	Primary	Secondary	Total	Attainment	Tertiary	Other	Total	Strength
	2				800.00%				800.00%
E8		2	0	2		0	0	2	
E7		3	0	3		0	0	3	
E6		8	0	8		0	0	8	
Other		3	0	3		0	0	3	
				16				16	

NMCB 133								Actual
	ROC/POE	Primary	Secondary	Total	Attainment	Tertiary	Other	Total	Strength
	2				1600.00%				1600.00%
E8		1	0	1		0	0	1	
E7		12	0	12		0	0	12	
E6		17	0	17		0	0	17	
Other		2	0	2		0	0	2	
				32				32	

Cumulative								Actual
	ROC/POE	Primary	Secondary	Total	Attainment	Tertiary	Other	Total	Strength
	8				1012.50%				1012.50%
E8		5	0	5		0	0	5	
E7		23	0	23		0	0	23	
E6		43	0	43		0	0	43	
Other		10	0	10		0	0	10	
				81				81	

Rate	BU	CE	CM	EA	EO	SW	UT	Total
Response	35	10	0	0	10	17	9	81
% Response	43%	12%	0%	0%	12%	21%	11%	100%

NEC 9502: Instructor

NMCB 1	ROC/POE	Primary	Secondary	Total	Attainment	Tertiary	Other	Total	Actual Strength
	6				166.67%				166.67%
E6		5	1	6		0	0	6	
E5		4	0	4		0	0	4	
Other		0	0	0		0	0	0	
				10				10	

NMCB 7	ROC/POE	Primary	Secondary	Total	Attainment	Tertiary	Other	Total	Actual Strength
	6				216.67%				216.67%
E6		4	1	5		0	0	5	
E5		8	0	8		0	0	8	
Other		0	0	0		0	0	0	
				13				13	

NMCB 74	ROC/POE	Primary	Secondary	Total	Attainment	Tertiary	Other	Total	Actual Strength
	6				100.00%				116.67%
E6		5	0	5		1	0	6	
E5		1	0	1		0	0	1	
Other		0	0	0		0	0	0	
				6				7	

NMCB 133	ROC/POE	Primary	Secondary	Total	Attainment	Tertiary	Other	Total	Actual Strength
	6				166.67%				183.33%
E6		2	2	4		1	0	5	
E5		6	0	6		0	0	6	
Other		0	0	0		0	0	0	
				10				11	

Cumulative	ROC/POE	Primary	Secondary	Total	Attainment	Tertiary	Other	Total	Actual Strength
	24				162.50%				170.83%
E6		16	4	20		2	0	22	
E5		19	0	19		0	0	19	
Other		0	0	0		0	0	0	
				39				41	

Appendix C

Survey Questionnaire Response Analysis

Survey Question 1:
What is your Rating?

	NMCB 1	NMCB 7	NMCB 74	NMCB 133	Total	% Total	Manning	% Manning	Variance
BU	7	10	9	9	35	30.43%	26	32.50%	2.07%
CE	0	4	3	4	11	9.57%	7	8.75%	-0.82%
CM	6	1	3	3	13	11.30%	12	15.00%	3.70%
EA	0	2	0	0	2	1.74%	2	2.50%	0.76%
EO	7	10	2	4	23	20.00%	16	20.00%	0.00%
SW	3	6	3	3	15	13.04%	8	10.00%	-3.04%
UT	1	4	5	6	16	13.91%	9	11.25%	-2.66%
Total	24	37	25	29	115	100.00%	80	100.00%	

Survey Question 2, 3, 4:
How much time do you have in the U. S. Navy?
Have you cross-rated from a previous rating?
How much time do you have in the NCF?

Time in U. S. Navy (Years)

	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Avg
NMCB 1						2	4		2	4	3	4	4		1			13.25
NMCB 7				1	1		3	6	3		4	5	5	2	4	2	1	14.11
NMCB 74					2		4		2	2	1	4	2	3	2	2	1	14.28
NMCB 133							1	1	6	4	2	5	1	5	2	2		14.17
Total	0	0	0	1	3	2	12	7	13	10	10	18	12	10	9	6	2	13.95
% Dist	**0%**	**0%**	**0%**	**1%**	**3%**	**2%**	**10%**	**6%**	**11%**	**9%**	**9%**	**16%**	**10%**	**9%**	**8%**	**5%**	**2%**	

Time in NMCBs

	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Avg
NMCB1	2				1	4	2		2	3	3	3	3		1			12
NMCB 7	3				5	3	3	1	1	2	3	5	3	2	4	2		12.8
NMCB 74	4		2		3	1	3		2	3		1	1	2	1	2		10.84
NMCB 133	1			1	1		2	1	4	3	3	4	2	5	2			13.52
Totals	10	0	2	1	10	8	10	2	9	11	9	13	9	9	8	4	0	12.29
% Dist	**9%**	**0%**	**2%**	**1%**	**9%**	**7%**	**9%**	**2%**	**8%**	**10%**	**8%**	**11%**	**8%**	**8%**	**7%**	**3%**	**0%**	

Cross-Rated

	Yes	%	No	%
NMCB 1	1	4	23	96
NMCB 7	2	5	35	95
NMCB 74	5	20	20	80
NMCB 133	2	7	27	93
Total	**10**	**9**	**115**	**91**

Survey Question 7:
How many years were you in the NCF before receiving your first NEC bearing school?
Second?
Third?
Other?

Average NEC Profile

	% With 1 NEC	% With 2 NECs	% With 3 NECs	% With 4+ NECs
NMCB 1	100.00%	58.30%	33.00%	16.67%
NMCB 7	100.00%	81.10%	46.00%	10.81%
NMCB 74	100.00%	72.00%	28.00%	8.00%
NMCB 133	100.00%	89.70%	44.80%	20.69%
Avg %	**100.00%**	**75.28%**	**37.95%**	**14.04%**

Average NEC Attainment Time (Years)

	1ST NEC	2ND NEC	3RD NEC	4+ NECs
NMCB 1	7.66	8.73	10.13	12.2
NMCB 7	6.35	10.4	11.76	12.6
NMCB 74	6.6	9.83	10.86	13.1
NMCB 133	7.72	9.85	11.23	12.9
Avg Yrs	**7.08**	**9.7**	**11**	**12.7**

Survey Question 8:
Was your NEC School an incentive by Detailers for your Re-Enlistment?

	Yes	No	% Yes	% No
NMCB 1	5	19	20.8	79.2
NMCB 7	5	32	13.5	86.5
NMCB 74	8	17	32	68
NMCB 133	7	22	24.1	75.9
Total	25	90		
		Average	**22.60%**	**77.40%**

Survey Question 9:

Were you sent to your first NEC School by:

Detail Shop during PCS orders?

Battalion while in homeport?

Battalion while on deployment?

(repeated for Secondary & Tertiary NECs)

		NMCB 1	NMCB 7	NMCB 74	NMCB 13	Total	% Dist Overall	% Dist Actual
1ST NEC								
	BUPERS	15	12	20	18	65	56.52%	**56.52%**
	NMCB/HP	9	24	3	7	43	37.39%	**37.39%**
	NMCB/DEP	0	1	0	2	3	2.61%	**2.61%**
	N/A - Other	0	0	2	2	4	3.48%	**3.48%**
	Total	24	37	25	29	115	100.00%	100.00%
2ND NEC								
	BUPERS	8	17	12	13	50	43.48%	**58.14%**
	NMCB/HP	5	11	5	13	34	29.57%	**39.53%**
	NMCB/DEP	0	2	0	0	2	1.74%	**2.33%**
	N/A	11	7	8	3	29	25.22%	**0.00%**
	Total	24	37	25	29	115	100.00%	100.00%
3RD NEC								
	BUPERS	3	6	3	7	19	16.52%	**42.22%**
	NMCB/HP	5	9	4	3	21	18.26%	**46.67%**
	NMCB/DEP	0	2	0	3	5	4.35%	**11.11%**
	N/A	16	20	18	16	70	60.87%	**0.00%**
	Total	24	37	25	29	115	100.00%	100.00%

Survey Question 21:
What do you feel was the primary management consideration for NEC School selection?

	NMCB 1	%	NMCB 7	%	NMCB 74	%	NMCB 133	%	Avg %
Ability	9	25.4	12	19.7	4	12.5	6	13	**17.65**
Evaluations	2	5.8	5	8.2	3	9.4	2	4.3	**6.93**
Performance	8	22.4	19	31.2	7	21.9	11	23.9	**24.85**
COC Support	4	11.2	9	14.8	3	9.4	5	10.9	**11.58**
Motivation	3	8.7	7	11.5	4	12.5	4	8.7	**10.35**
Politics	3	8.7	6	9.8	2	6.3	10	21.7	**11.63**
Favoritism	5	13.9	2	3.3	2	6.3	3	6.5	**7.5**
S7/S3 Random	1	2.9	1	1.6	7	21.9	5	10.9	**9.33**
Total Hits	35	99	61	100	32	100.2	46	99.9	99.8

Survey Questions 20, 22, 23:

Did you feel a sense of competition for selection to attend a NEC bearing school?

Have you ever felt you were more qualified or professionally adept than others selected you were for a NEC School you were interested in?

Have you ever sensed favoritism as a primary reason on behalf of upper management for selection to attend a NEC School?

Competition

	Yes	No	Total	% Yes	% No
NMCB 1	14	10	24	58.33%	41.67%
NMCB 7	17	20	37	45.95%	54.05%
NMCB 74	9	16	25	36.00%	64.00%
NMCB 133	12	17	29	41.38%	58.62%
Avg	13	15.75	115	**45.41%**	**54.59%**

Qualified

	Yes	No	Total	% Yes	% No
NMCB 1	7	17	24	29.17%	70.83%
NMCB 7	10	27	37	27.03%	72.97%
NMCB 74	10	15	25	40.00%	60.00%
NMCB 133	14	15	29	48.28%	51.72%
Avg	10.25	18.5	115	**36.12%**	**63.88%**

Favoritism

	Yes	No	Total	% Yes	% No
NMCB 1	10	14	24	41.67%	58.33%
NMCB 7	7	30	37	18.92%	81.08%
NMCB 74	8	17	25	32.00%	68.00%
NMCB 133	10	19	29	34.48%	65.52%
Avg	8.75	20	115	**31.77%**	**68.23%**

Survey Questions 15 & 16:

On a scale of 1 to 10, how effectively do you feel your NEC School prepared you technically for project supervisory type positions?

On a scale of 1 to 10, how effectively do you feel your NEC School prepared you managerially for project supervisory type positions?

Technically

	1	2	3	4	5	6	7	8	9	10	Total	Avg
NMCB 1	1				1	1	3	11	3	4	24	**7.83**
NMCB 7	1		2	2	2	5	4	6	7	8	37	**7.4**
NMCB 74	3			1	2	4	4	6	2	3	25	**6.6**
NMCB 133	1		3	2	3	2	2	7	3	6	29	**6.96**
Total	6	0	5	5	8	12	13	30	15	21	115	**7.2**
% Hits	**5.22%**	**0.00%**	**4.35%**	**4.35%**	**6.96%**	**10.43%**	**11.30%**	**26.09%**	**13.04%**	**18.26%**	**100.00%**	

Managerially

	1	2	3	4	5	6	7	8	9	10	Total	Avg
NMCB 1	1		1	1	2	5	3	5	2	4	24	**6.92**
NMCB 7		1	2	4	1	5	4	10	5	5	37	**7.08**
NMCB 74	3		1	4	3	2	4	6		2	25	**5.8**
NMCB 133	3		2		5		7	6	3	3	29	**6.48**
Total	7	1	6	9	11	12	18	27	10	14	115	**6.57**
% Hits	**6.09%**	**0.87%**	**5.22%**	**7.83%**	**9.57%**	**10.43%**	**15.65%**	**23.48%**	**8.70%**	**12.17%**	**100.00%**	

Survey Questions 24 & 25:

During your last shore assignment, was your detailing a result of your NEC, or did you have freedom to select your shore assignment?

Have you applied your NEC skills while on shore assignment?

Assignment	NEC	Personal Choice	Total	% NEC	% Per Choice
NMCB 1	3	21	24	12.50%	87.50%
NMCB 7	4	33	37	10.81%	89.19%
NMCB 74	7	18	25	28.00%	72.00%
NMCB 133	3	26	29	10.34%	89.66%
Avg	4.25	24.5	115	**15.41%**	**84.59%**

Utilization	Rarely	Often	Total	% Rarely	% Often
NMCB 1	11	13	24	45.83%	54.17%
NMCB 7	13	24	37	35.14%	64.86%
NMCB 74	11	14	25	44.00%	56.00%
NMCB 133	16	13	29	55.17%	44.83%
Avg	12.75	16.25	115	**44.58%**	**55.42%**

Survey Question 10:
Were you Detailed to your present assignment to fill a NEC vacancy?

	Yes	No	Don't Know	% Yes	% No	% Don't Know	Total %
NMCB 1	4	12	8	17.00%	50.00%	33.00%	100.00%
NMCB 7	17	13	7	46.00%	35.00%	19.00%	100.00%
NMCB 74	6	11	8	24.00%	44.00%	32.00%	100.00%
NMCB 133	8	16	5	27.60%	55.20%	17.20%	100.00%
Total	35	52	28				115
Avg	8.75	13	7	**28.65%**	**46.05%**	**25.30%**	

% Yes = 28.65
% No/Do Not Know = 71.35

Survey Questions 26 & 27:

Did you know certain NECs such as Safety Inspector and Construction Inspector are currently overtrained at 538% and 316%, respectively?

Did you know that despite having 323 NEC 6021 Safety Inspectors in the NCF, we only have 64 total billets and only 38 NEC holders are actually filling a billet?

Safety & Con Insp

	Yes	No	Total	% Yes	% No
NMCB 1	1	23	24	4.17%	95.83%
NMCB 7	6	31	37	16.22%	83.78%
NMCB 74	0	25	25	0.00%	100.00%
NMCB 133	3	26	29	10.34%	89.66%
Avg	2.5	26.25	115	**7.68%**	**92.32%**

Safety

	Yes	No	Total	% Yes	% No
NMCB 1	0	24	24	0.00%	100.00%
NMCB 7	4	33	37	10.81%	89.19%
NMCB 74	0	25	25	0.00%	100.00%
NMCB 133	2	27	29	6.90%	93.10%
Avg	1.5	27.25	115	**4.43%**	**95.57%**

Survey Question 11:

On a scale of 1 to 10, how effectively do you feel the NCF has utilized your Primary NEC related talents?
Secondary?
Tertiary?

Primary NEC

Rating	0	1	2	3	4	5	6	7	8	9	10	N/A	Total	Avg
NMCB 1	1	1		1	2	4	1	2	5	1	6		24	6.71
NMCB 7		8			1	5	4	2	6	3	8		37	6.22
NMCB 74		7	1		2	4	1	4	3		3		25	5
NMCB 133		6	2		1	2	1		7	2	8		29	6.34
Total	1	22	3	1	6	15	7	8	21	6	25	0	115	6.07
% Hits	0	19%	3%	1%	5%	13%	6%	7%	18%	5%	22%	0%		

Secondary NEC

	0	1	2	3	4	5	6	7	8	9	10	N/A	Total	Avg
NMCB 1	1	3	1	1		2			3	1	3	9	24	5.4
NMCB 7		6	2			9	6	2	1	1	3	7	37	4.96
NMCB 74		5	1	2	1	1		4	4			7	25	4.55
NMCB 133		4	3	4		6	1	2	2	1	3	3	29	4.88
Total	1	18	7	7	1	18	7	8	10	3	9	26	115	4.95
% Hits	0	16%	6%	6%	1%	16%	6%	7%	9%	3%	8%	23%		
% Dist	1%	20%	8%	8%	1%	20%	8%	9%	11%	3%	10%			

Tertiary NEC

	0	1	2	3	4	5	6	7	8	9	10	N/A	Total	Avg
NMCB 1		3		1		1	1		1	1	2	14	24	5.4
NMCB 7		4	1	1	1	4	1			1	4	20	37	5.18
NMCB 74		4				1		1			1	18	25	3.71
NMCB 133		3	2	2	1	1	1	1			2	16	29	4.23
Total	0	14	3	4	2	7	3	2	1	2	9	68	115	4.63
% Hits	0	12%	3%	3%	2%	6%	3%	2%	1%	2%	8%	59%		
% Dist	0%	30%	6%	9%	4%	15%	6%	4%	2%	4%	19%			

Survey Question 5 & 6:
What is your current Battalion position?
(related to)
What is your Primary NEC?
Secondary NEC?
Tertiary NEC?
Other (if applicable)?

	Primary NEC	Secondary NEC	Tertiary NEC	None	Total
NMCB 1	12	2	1	9	24
NMCB 7	14	5	3	15	37
NMCB 74	12	2	0	11	25
NMCB 133	13	3	0	13	29
Total	51	12	4	48	115
% Grouping	44.35%	10.43%	3.48%	41.74%	100.00%

Related = 58.26%
Non-Related = 41.74%

Survey Questions 12 & 13:
Have you ever been given a Battalion assignment as a direct result of any of your NECs?
Have you ever filled a Battalion position not related to any of your NECs?

Direct Result

	Yes	No	Total	% Yes	% No
NMCB 1	10	14	24	41.67%	58.33%
NMCB 7	22	15	37	59.46%	40.54%
NMCB 74	9	16	25	36.00%	64.00%
NMCB 133	13	16	29	44.83%	55.17%
Avg	13.5	15.25	115	**45.49%**	**54.51%**

Not Related

	Yes	No	Total	% Yes	% No
NMCB 1	9	15	24	37.50%	62.50%
NMCB 7	14	23	37	37.84%	62.16%
NMCB 74	11	14	25	44.00%	56.00%
NMCB 133	14	15	29	48.28%	51.72%
Avg	12	16.75	115	**41.90%**	**58.10%**

Survey Question 14:

On a scale of 1 to 10, does your current position maximize your NEC related skills?

Primary?
Secondary?
Tertiary?

Primary NEC	Rating													
	0	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**N/A**	**Total**	**Avg**
NMCB 1	1	5	2	2	2	1		1	2	1	7		24	**5.41**
NMCB 7		10	2	3	1	4	1	3	1	3	9		37	**5.37**
NMCB 74		9		1	1	5		2	1	2	4		25	**4.84**
NMCB 133		5	2	1	1	6	1	3	3		7		29	**5.76**
Total	1	29	6	7	5	16	2	9	7	6	27	0	115	**5.35**
% Hits	**0**	**25%**	**5%**	**6%**	**4%**	**14%**	**2%**	**8%**	**6%**	**5%**	**23%**	**0%**		

Secondary NEC														
	0	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**N/A**	**Total**	**Avg**
NMCB 1	2	5	1	1		3	1			1	1	9	24	**3.33**
NMCB 7		9	2	3	2	5	1	1	2	2	3	7	37	**4.4**
NMCB 74		7	2			5	1			1	2	7	25	**3.94**
NMCB 133		3	2	2	3	6	2	2	4	1	1	3	29	**5.08**
Total	2	24	7	6	5	19	5	3	6	5	7	26	115	**4.19**
% Hits	0	21%	6%	5%	4%	17%	4%	3%	5%	4%	6%	23%		
% Dist	**2%**	**27%**	**8%**	**7%**	**6%**	**21%**	**6%**	**3%**	**7%**	**6%**	**8%**			

Tertiary NEC														
	0	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**N/A**	**Total**	**Avg**
NMCB 1	1	5		1	1	1					1	14	24	**2.7**
NMCB 7		4	1	1	1	4	1			1	4	20	37	**3.29**
NMCB 74		4				1			1		1	18	25	**3.85**
NMCB 133		5	1	1	2	1		1		1	1	16	29	**3.77**
Total	1	18	2	3	4	7	1	1	1	2	7	68	115	**3.4**
% Hits	0	16%	2%	3%	3%	6%	1%	1%	1%	2%	6%	59%		
% Dist	**0%**	**38%**	**4%**	**6%**	**9%**	**15%**	**2%**	**2%**	**2%**	**4%**	**15%**			

Survey Questions 17, 18, & 19:

Do you feel management has given assignments without regard to yours or others NEC?
Do you feel management studies or considers NEC skills prior to making position assignments?
In general, do you feel the NCF manages an effective NEC training and utilization program that maximizes available resources?

Assignments Without Regard to NEC?

	Yes	No	Total	%Yes	%No
NMCB 1	12	12	24	50.00%	50.00%
NMCB 7	22	15	37	59.46%	40.54%
NMCB 74	18	7	25	72.00%	28.00%
NMCB 133	19	10	29	65.52%	34.48%
Total	71	44	115		
Avg	17.75	11		**61.74%**	**38.26%**

Mgmt Studies or Considers NECs?

	Yes	No	Total	%Yes	%No
NMCB 1	12	12	24	50.00%	50.00%
NMCB 7	19	18	37	51.35%	48.65%
NMCB 74	8	17	25	32.00%	68.00%
NMCB 133	7	22	29	24.14%	75.86%
Total	46	69	115		
Avg	11.5	17.25		**39.37%**	**60.63%**

The CEC Manages an Effective Program?

	Yes	No	Total	%Yes	%No
NMCB 1	12	12	24	50.00%	50.00%
NMCB 7	17	20	37	45.95%	54.05%
NMCB 74	8	17	25	32.00%	68.00%
NMCB 133	6	23	29	20.69%	79.31%
Total	43	72	115		
Avg	10.75	18		**37.16%**	**62.84%**

Appendix D

NEC Utilization Response Analysis

NEC 5503: Advanced Engineering Aid

Primary

		NMCB 17	NMCB 17	NMCB 7413	MCB 1 7413	Total	% Hits
Total		0	1	0	0	1	
Utilization Rating	10		1			1	100%
	9					0	0%
	8					0	0%
	7					0	0%
	6					0	0%
	5					0	0%
	4					0	0%
	3					0	0%
	2					0	0%
	1					0	0%
	Total		10			10	
	Avg		10			10	

Rating	Rate BU	CE	CM	EA	EO	SW	UT
10				1			
9							
8							
7							
6							
5							
4							
3							
2							
1							
Total				10			
Avg				10			
					Overall Avg =		10

Secondary

		NMCB 17	NMCB 17	NMCB 7413	MCB 1 7413	Total	% Hits
		0	1	0	0	1	
	10		1			1	100%
	9					0	0%
	8					0	0%
	7					0	0%
	6					0	0%
	5					0	0%
	4					0	0%
	3					0	0%
	2					0	0%
	1					0	0%
			10			10	
	Avg		10			10	

	Rate BU	CE	CM	EA	EO	SW	UT
				1			
				10			
				10			
					Overall Avg =		10

Tertiary

		NMCB 17	NMCB 17	NMCB 7413	MCB 1 7413	Total	% Hits
		0	0	0	0	0	
	10					0	N/A
	9					0	N/A
	8					0	N/A
	7					0	N/A
	6					0	N/A
	5					0	N/A
	4					0	N/A
	3					0	N/A
	2					0	N/A
	1					0	N/A
						0	
	Avg						

	Rate BU	CE	CM	EA	EO	SW	UT
					Overall Avg =		N/A

NEC 5635: Advanced Construction Electrician

Primary

		NMCB 1	NMCB 7	NMCB 7 4	NMCB 1 3	Total	% Hits
Total			1	1		2	
Utilization Rating	10					0	0%
	9					0	0%
	8					0	0%
	7			1		1	50%
	6					0	0%
	5		1			1	50%
	4					0	0%
	3					0	0%
	2					0	0%
	1					0	0%
	Total		5	7		12	
	Avg		5	7		6.00	

Rating	Rate BU	CE	CM	EA	EO	SW	UT
10							
9							
8							
7		1					
6							
5		1					
4							
3							
2							
1							
Total		12					
Avg		6					

Overall Avg = 6.00

Secondary

	NMCB 1	NMCB 7	NMCB 7 4	NMCB 1 3	Total	% Hits
	0	0	1	1	2	
10			1		1	50%
9					0	0%
8					0	0%
7					0	0%
6					0	0%
5					0	0%
4					0	0%
3				1	1	50%
2					0	0%
1					0	0%
			10	3	13	
Avg			10	1	6.50	

Rate BU	CE	CM	EA	EO	SW	UT
	1					
	1					
	13					
	6.5					

Overall Avg = 6.50

Tertiary

	NMCB 1	NMCB 7	NMCB 7 4	NMCB 1 3	Total	% Hits
	0	0	0	2	2	
10					0	0%
9					0	0%
8					0	0%
7					0	0%
6					0	0%
5					0	0%
4				1	1	50%
3				1	1	50%
2					0	0%
1					0	0%
				7	7	
Avg				3.5	3.5	

Rate BU	CE	CM	EA	EO	SW	UT
	1					
	1					
	7					
	3.5					

Overall Avg = 3.5

NEC 5644: Cable Splicing Technician

Primary

Utilization Rating	NMCB 1	NMCB 7	NMCB 7 4	NMCB 1 3	Total	% Hits
Total	0	1	1	2	4	
10				1	1	25%
9					0	0%
8					0	0%
7					0	0%
6					0	0%
5					0	0%
4		1			1	25%
3					0	0%
2					0	0%
1			1	1	2	50%
Total		4	1	11	16	
Avg		4	1	5.5	4.00	

Rating	Rate BU	CE	CM	EA	EO	SW	UT
10		1					
9							
8							
7							
6							
5							
4		1					
3							
2							
1		2					
Total		16					
Avg		4					
					Overall Avg =		4.00

Secondary

Utilization Rating	NMCB 1	NMCB 7	NMCB 7 4	NMCB 1 3	Total	% Hits
	0	2	0	1	3	
10					0	0%
9					0	0%
8					0	0%
7					0	0%
6					0	0%
5					0	0%
4				1	1	33%
3					0	0%
2					0	0%
1		2			2	67%
		2		4	6	
Avg		1		4	2.00	

Rate BU	CE	CM	EA	EO	SW	UT
	1					
	2					
	6					
	2					
				Overall Avg =		2.00

Tertiary

Utilization Rating	NMCB 1	NMCB 7	NMCB 7 4	NMCB 1 3	Total	% Hits
	0	0	0	0	0	
10					0	N/A
9					0	N/A
8					0	N/A
7					0	N/A
6					0	N/A
5					0	N/A
4					0	N/A
3					0	N/A
2					0	N/A
1					0	N/A
					0	
Avg						

Rate BU	CE	CM	EA	EO	SW	UT
				Overall Avg =		0

NEC 5707: Water Well Drilling Technician

Primary

Utilization Rating	NMCB 1	NMCB 7	NMCB 74	MCB 133	Total	% Hits
10					0	0%
9					0	0%
8					0	0%
7					0	0%
6					0	0%
5					0	0%
4					0	0%
3	1				1	17%
2				1	1	17%
1		3		1	4	67%
Total	3	3	0	3	9	
Avg	3.00	1.00	0.00	1.50	1.50	

Rating	Rate BU	CE	CM	EA	EO	SW	UT
10							
9							
8							
7							
6							
5							
4							
3							1
2					1		
1					3		1
Total					5		4
Avg					2.25		2.00
					Overall Avg =		1.50

Secondary

Utilization Rating	NMCB 1	NMCB 7	NMCB 74	MCB 133	Total	% Hits
10			1		1	20%
9			1		1	20%
8					0	0%
7					0	0%
6					0	0%
5					0	0%
4					0	0%
3					0	0%
2					0	0%
1	2			1	3	60%
Total	2	0	19	1	22	
Avg	1.00	0.00	9.50	1.00	4.40	

Rate BU	CE	CM	EA	EO	SW	UT
		1				
				1		
		10		12		
		10.00		3.00		
				Overall Avg =		4.40

Tertiary

Utilization Rating	NMCB 1	NMCB 7	NMCB 74	MCB 133	Total	% Hits
10					0	0%
9					0	0%
8					0	0%
7					0	0%
6					0	0%
5					0	0%
4					0	0%
3		1			1	50%
2					0	0%
1			1		1	50%
Total	0	1	1	0	2	
Avg	0.00	1.00	1.00	0.00	2.00	

Rate BU	CE	CM	EA	EO	SW	UT
				1		
				3		1
				3.00		1.00
				Overall Avg =		2.00

NEC 5708: Blaster

Primary

Utilization Rating	NMCB 1	NMCB 7	NMCB 4	MCB 13	Total	% Hits
Total	1	1	0	1	3	
10	1				1	33%
9					0	0%
8					0	0%
7					0	0%
6					0	0%
5					0	0%
4					0	0%
3					0	0%
2					0	0%
1		1		1	2	67%
Total	10	1	0	1	12	
Avg	10.00	1.00	0.00	1.00	4.00	

Rating	Rate BU	CE	CM	EA	EO	SW	UT
10					1		
9							
8							
7							
6							
5							
4							
3							
2							
1					2		
Total					12		
Avg					4.00		
					Overall Avg =		4.00

Secondary

	NMCB 1	NMCB 7	NMCB 4	MCB 13	Total	% Hits
	0	4	0	0	4	
10					0	0%
9					0	0%
8		1			1	25%
7					0	0%
6					0	0%
5					0	0%
4					0	0%
3					0	0%
2					0	0%
1		3			3	75%
	0	11	0	0	11	
Avg	0.00	2.75	0.00	0.00	2.75	

Rate BU	CE	CM	EA	EO	SW	UT
				1		
				3		
				11		
				2.75		
				Overall Avg =		2.75

Tertiary

	NMCB 1	NMCB 7	NMCB 4	MCB 13	Total	% Hits
	0	0	0	0	0	
10					0	N/A
9					0	N/A
8					0	N/A
7					0	N/A
6					0	N/A
5					0	N/A
4					0	N/A
3					0	N/A
2					0	N/A
1			0		0	N/A
	0	0	0	0	0	
Avg	0.00	0.00	0.00	0.00	0.00	

Rate BU	CE	CM	EA	EO	SW	UT
				Overall Avg =		N/A

NEC 5710: Advanced Equipment Operator

Primary

Utilization Rating	NMCB 1	NMCB 7	NMCB 4	NMCB 3	Total	% Hits
Total	5	4	2	2	13	
10	2	1	1	1	5	38%
9	1				1	8%
8		2		1	3	23%
7	1				1	8%
6					0	0%
5					0	0%
4	1				1	8%
3					0	0%
2					0	0%
1		1	1		2	15%
Total	40	27	11	18	96	
Avg	8.00	6.75	5.50	9.00	7.38	

Rating	Rate BU	CE	CM	EA	EO	SW	UT
10					5		
9					1		
8					3		
7					7		
6							
5							
4					1		
3							
2							
1					2		
Total					96		
Avg					7.38		
					Overall Avg =		7.38

Secondary

Utilization Rating	NMCB 1	NMCB 7	NMCB 4	NMCB 3	Total	% Hits
	1	3	0	1	5	
10				1	1	20%
9					0	0%
8		1			1	20%
7					0	0%
6					0	0%
5		1			1	20%
4					0	0%
3	1	1			2	40%
2					0	0%
1					0	0%
	3	16	0	10	29	
Avg	3.00	5.33	0.00	10.00	5.80	

Rate BU	CE	CM	EA	EO	SW	UT
				1		
				1		
				1		
				2		
				29		
				5.80		
				Overall Avg =		5.80

Tertiary

Utilization Rating	NMCB 1	NMCB 7	NMCB 4	NMCB 3	Total	% Hits
	0	0	0	0	0	
10					0	N/A
9					0	N/A
8					0	N/A
7					0	N/A
6					0	N/A
5					0	N/A
4					0	N/A
3					0	N/A
2					0	N/A
1					0	N/A
	0	0	0	0	0	
Avg	0.00	0.00	0.00	0.00	0.00	

Rate BU	CE	CM	EA	EO	SW	UT
				0		
				0		0
				0.00		0.00
				Overall Avg =		N/A

NEC 5805: Advanced Construction Mechanic

Primary

		NMCB 1	NMCB 7	NMCB 7	NMCB 3	NMCB 3	Total 14	% Hits
Total		7	1	3	3	14		
Utilization Rating	10	2	1	1	1	5	0	36%
	9	2		1		3	0	21%
	8	1				1	0	7%
	7					0	0	0%
	6					0	0	0%
	5					0	0	0%
	4				1	1	0	7%
	3			1		1	0	7%
	2					0	0	0%
	1	2			1	3	0	21%
	Total	48	10	22	15	95		
	Avg	6.86	10.00	7.33	5.00	6.79		

Rating	Rate BU	CE	CM	EA	EO	SW	UT
10			5				
9			3				
8			1				
7							
6							
5							
4			1				
3			1				
2							
1			3				
Total			95				
Avg			6.79				
					Overall Avg =		6.79

Secondary

	NMCB 1	NMCB 7	NMCB 7	NMCB 3	NMCB 3	Total 14	% Hits
	0	0	0	0	0		
10					0	N/A	
9					0	N/A	
8					0	N/A	
7					0	N/A	
6					0	N/A	
5					0	N/A	
4					0	N/A	
3					0	N/A	
2					0	N/A	
1					0	N/A	
	0	0	0	0	0		
Avg	0.00	0.00	0.00	0.00	0.00		

Rate BU	CE	CM	EA	EO	SW	UT
				Overall Avg =		N/A

Tertiary

	NMCB 1	NMCB 7	NMCB 7	NMCB 3	NMCB 3	Total 14	% Hits
	0	0	0	0	0		
10					0	N/A	
9					0	N/A	
8					0	N/A	
7					0	N/A	
6					0	N/A	
5					0	N/A	
4					0	N/A	
3					0	N/A	
2					0	N/A	
1					0	N/A	
	0	0	0	0	0		
Avg	0.00	0.00	0.00	0.00	0.00		

Rate BU	CE	CM	EA	EO	SW	UT
				Overall Avg =		N/A

NEC 5907: Advanced Builder

Primary

		NMCB 1	NMCB 7	NMCB 7 4	NMCB 1 3	Total	% Hits
Total		7	4	3	1	15	
	10		1	1		2	13%
	9					0	0%
	8					0	0%
	7					0	0%
Utilization	6		1			1	7%
Rating	5				1	1	7%
	4			1		1	7%
	3	1				1	7%
	2	2				2	13%
	1	4	2	1		7	47%
	Total	11	18	15	5	49	
	Avg	1.57	4.50	5.00	5.00	3.27	

Rating	Rate BU	CE	CM	EA	EO	SW	UT
10	2						
9							
8							
7							
6	1						
5	1						
4	1						
3	1						
2	2						
1	7						
Total	49						
Avg	3.27						
					Overall Avg =		3.27

Secondary

		NMCB 1	NMCB 7	NMCB 7 4	NMCB 1 3	Total	% Hits
		1	7	4	3		
	10		1			1	13%
	9		1			1	13%
	8				1	1	13%
	7				1	1	13%
	6		1			1	13%
	5					0	0%
	4				1	1	13%
	3					0	0%
	2					0	0%
	1	1		1		2	25%
	Avg	1	25	1	19	46	
		1.00	8.33	1.00	6.33	5.75	

Rate BU	CE	CM	EA	EO	SW	UT
1						
1						
1						
1						
1						
1						
2						
46						
5.75						
					Overall Avg =	5.75

Tertiary

		NMCB 1	NMCB 7	NMCB 7 4	NMCB 1 3	Total	% Hits
		1	7	4	3		
	10					0	0%
	9					0	0%
	8					0	0%
	7					0	0%
	6					0	0%
	5					0	0%
	4					0	0%
	3					0	0%
	2					0	0%
	1				1	1	100%
		0	0	0	1	1	
	Avg	0.00	0.00	0.00	1.00	1.00	

Rate BU	CE	CM	EA	EO	SW	UT
1						
1						
1.00						
				Overall Avg =		1.00

NEC 5908: Tool & Equipment Technician

Primary

Utilization Rating	NMCB 1	NMCB 7	NMCB 7 4	NMCB 1 3	Total	% Hits
Total	1	0	1	0	2	
10					0	0%
9					0	0%
8					0	0%
7					0	0%
6					0	0%
5			1		1	50%
4					0	0%
3					0	0%
2					0	0%
1	1				1	50%
Total	1	0	5	0	6	
Avg	1.00	0.00	5.00	0.00	3.00	

Rating	Rate BU	CE	CM	EA	EO	SW	UT
10							
9							
8							
7							
6							
5	1						
4							
3							
2							
1	1						
Total	6						
Avg	3.00						
					Overall Avg =		3.00

Secondary

Utilization Rating	NMCB 1	NMCB 7	NMCB 7 4	NMCB 1 3	Total	% Hits
Total	0	2	1	1	4	
10					0	0%
9					0	0%
8					0	0%
7					0	0%
6					0	0%
5		1		1	2	50%
4					0	0%
3					0	0%
2					0	0%
1		1	1		2	50%
Total	0	6	1	5	12	
Avg	0.00	3.00	1.00	5.00	3.00	

Rating	Rate BU	CE	CM	EA	EO	SW	UT
2							
2							
12							
3.00					Overall Avg =		3.00

Tertiary

Utilization Rating	NMCB 1	NMCB 7	NMCB 7 4	NMCB 1 3	Total	% Hits
Total	0	1	0	0	1	
10					0	0%
9					0	0%
8					0	0%
7					0	0%
6					0	0%
5					0	0%
4					0	0%
3					0	0%
2					0	0%
1		1			1	100%
Total	0	1	0	0	1	
Avg	0.00	1.00	0.00	0.00	1.00	

Rating	Rate BU	CE	CM	EA	EO	SW	UT
1							
1							
1.00					Overall Avg =		1.00

SW 6010: Advanced Steelworker

Primary

Utilization Rating	NMCB 1	NMCB 17	NMCB 747	NMCB 133	Total	% Hits
Total	0	3	2	1	6	
10					0	0%
9		1			1	17%
8			1		1	17%
7					0	0%
6					0	0%
5		1		1	2	33%
4					0	0%
3		1			1	17%
2					0	0%
1			1		1	17%
Total	0	17	9	5	31	
Avg	0.00	5.67	4.50	5.00	5.17	

Rating	Rate BU	CE	CM	EA	EO	SW	UT
10							
9						1	
8						1	
7							
6							
5						2	
4							
3						1	
2							
1						1	
Total						31	
Avg						5.17	
					Overall A		5.17

Secondary

Utilization Rating	NMCB 1	NMCB 17	NMCB 747	NMCB 133	Total	% Hits
	1	2	0	1	4	
10					0	0%
9					0	0%
8					0	0%
7					0	0%
6					0	0%
5					0	0%
4		1			1	25%
3				1	1	25%
2	1	1			2	50%
1					0	0%
	2	6	0	3	11	
Avg	2.00	3.00	0.00	3.00	2.75	

Rate BU	CE	CM	EA	EO	SW	UT
					1	
					1	
					2	
					11	
					2.75	
				Overall Avg =		2.75

Tertiary

Utilization Rating	NMCB 1	NMCB 17	NMCB 747	NMCB 133	Total	% Hits
	1	0	0	0	1	
10	1				1	100%
9					0	0%
8					0	0%
7					0	0%
6					0	0%
5					0	0%
4					0	0%
3					0	0%
2					0	0%
1					0	0%
	10	0	0	0	10	
Avg	10.00	0.00	0.00	0.00	10.00	

Rate BU	CE	CM	EA	EO	SW	UT
					1	
					10	
					10.00	
				Overall Avg =		10.00

NEC 6104: Shore Based Air Conditioning & Refrigeration Technician

Primary

		NMCB 1	NMCB 7	NMCB 4	MCB 3	Total	% Hits
Total		0	0	0	1	1	
Utilization Rating	10					0	0%
	9					0	0%
	8					0	0%
	7					0	0%
	6					0	0%
	5				1	1	100%
	4					0	0%
	3					0	0%
	2					0	0%
	1					0	0%
	Total	0	0	0	5	5	
	Avg	0.00	0.00	0.00	5.00	5.00	

Rating	Rate BU	CE	CM	EA	EO	SW	UT
10							
9							
8							
7							
6							
5							1
4							
3							
2							
1							
Total							5
Avg							5.00
					Overall Avg =		5.00

Secondary

	NMCB 1	NMCB 7	NMCB 4	MCB 3	Total	% Hits
	1	1	1	2	5	
10					0	0%
9		1			1	20%
8					0	0%
7					0	0%
6				1	1	20%
5	1				1	20%
4					0	0%
3					0	0%
2				1	1	20%
1			1		1	20%
	5	9	1	8	23	
Avg	5.00	9.00	1.00	4.00	4.60	

Rate BU	CE	CM	EA	EO	SW	UT
						1
						1
						1
						1
						1
						23
						4.60
				Overall Avg =		4.60

Tertiary

	NMCB 1	NMCB 7	NMCB 4	MCB 3	Total	% Hits
	0	2	0	0	2	
10					0	0%
9					0	0%
8					0	0%
7					0	0%
6					0	0%
5					0	0%
4					0	0%
3					0	0%
2					0	0%
1		2			2	100%
	0	2	0	0	2	
Avg	0.00	1.00	0.00	0.00	1.00	

Rate BU	CE	CM	EA	EO	SW	UT
						2
						1.00
				Overall Avg =		1.00

NEC 6105: Advanced Utilitiesman

Primary

Utilization Rating	NMCB 1	NMCB 7	NMCB 4	NMCB 13	Total	% Hits
Total	1	2	2	1	6	
10					0	0%
9		1			1	17%
8					0	0%
7		1	1		2	33%
6					0	0%
5	1			1	2	33%
4					0	0%
3					0	0%
2					0	0%
1			1		1	17%
Total	5	16	8	5	34	
Avg	5.00	8.00	4.00	5.00	5.67	

Rating	Rate BU	CE	CM	EA	EO	SW	UT
10							
9							1
8							
7							2
6							
5							2
4							
3							
2							
1							1
Total							34
Avg							5.67
					Overall Avg =		5.67

Secondary

	NMCB 1	NMCB 7	NMCB 4	NMCB 13	Total	% Hits
10					0	0%
9				1	1	20%
8				1	1	20%
7				1	1	20%
6					0	0%
5			1		1	20%
4					0	0%
3					0	0%
2					0	0%
1		1			1	20%
Avg	0	1	5	24	30	
Avg	0.00	1.00	5.00	8.00	6.00	

Rate BU	CE	CM	EA	EO	SW	UT
						1
						1
						1
						1
						1
						30
						6.00
				Overall Avg =		6.00

Tertiary

	NMCB 1	NMCB 7	NMCB 4	NMCB 13	Total	% Hits
10					0	0%
9					0	0%
8					0	0%
7					0	0%
6					0	0%
5					0	0%
4					0	0%
3					0	0%
2				1	1	50%
1		1			1	50%
Avg	0	1	0	2	3	
Avg	0.00	1.00	0.00	2.00	1.50	

Rate BU	CE	CM	EA	EO	SW	UT
						1
						1
						3
						1.50
				Overall Avg =		1.50

NEC 5501: Construction Inspector

Primary

Utilization Rating	NMCB 1	NMCB 7	NMCB 4	NMCB 3	Total	% Hits
Total	3	7	4	7	21	
10	1	3	1	4	9	43%
9					0	0%
8					0	0%
7		1			1	5%
6					0	0%
5		1	5	1	7	33%
4	1				1	5%
3		1		1	2	10%
2					0	0%
1		1		1	2	10%
Total	15	46	25	49	135	
Avg	5.00	6.57	6.25	7.00	6.43	

Rating	Rate BU	CE	CM	EA	EO	SW	UT
10	1	2		10	1	1	3
9							
8							
7	1						
6							
5	2						3
4						1	
3	1					1	
2							
1	2			1			
Total	32	20		11	10	17	45
Avg	4.57	10.00		5.50	10.00	5.67	7.50
					Overall Avg =		6.43

Secondary

	NMCB 1	NMCB 7	NMCB 4	NMCB 3	Total	% Hits
	0	2	2	2	6	
10		1			1	17%
9					0	0%
8					0	0%
7					0	0%
6					0	0%
5			1	2	3	50%
4					0	0%
3					0	0%
2					0	0%
1		1	1		2	33%
	0	11	6	10	27	
Avg	0.00	5.50	3.00	5.00	4.50	

Rate BU	CE	CM	EA	EO	SW	UT
	1					
1	1				1	
1						1
6	15				5	1
3.00	7.50				5.00	1.00
				Overall Avg =		4.50

Tertiary

	NMCB 1	NMCB 7	NMCB 4	NMCB 3	Total	% Hits
	1	2	0	0	3	
10		2			2	67%
9					0	0%
8					0	0%
7					0	0%
6					0	0%
5					0	0%
4					0	0%
3					0	0%
2					0	0%
1	1				1	33%
	1	20	0	0	21	
Avg	1.00	10.00	0.00	0.00	7.00	

Rate BU	CE	CM	EA	EO	SW	UT
1						1
				1		
10				1		10
10.00				1.00		10.00
				Overall Avg =		7.00

NEC 5501: Construction Inspector

Primary

Utilization Rating	NMCB 1	NMCB 7	NMCB 7 4	NMCB 1 3	Total	% Hits
Total	3	7	4	7	21	
10	1	3	1	4	9	43%
9					0	0%
8					0	0%
7		1			1	5%
6					0	0%
5		1	5	1	7	33%
4	1				1	5%
3		1		1	2	10%
2					0	0%
1		1		1	2	10%
Total	15	46	25	49	135	
Avg	5.00	6.57	6.25	7.00	6.43	

Rating	Rate BU	CE	CM	EA	EO	SW	UT
10	1	2		10	1	1	3
9							
8							
7	1						
6							
5	2						3
4						1	
3	1					1	
2							
1	2			1			
Total	32	20		11	10	17	45
Avg	4.57	10.00		5.50	10.00	5.67	7.50
					Overall Avg =		6.43

Secondary

Utilization Rating	NMCB 1	NMCB 7	NMCB 7 4	NMCB 1 3	Total	% Hits
Total	0	2	2	2	6	
10		1			1	17%
9					0	0%
8					0	0%
7					0	0%
6					0	0%
5			1	2	3	50%
4					0	0%
3					0	0%
2					0	0%
1		1	1		2	33%
	0	11	6	10	27	
Avg	0.00	5.50	3.00	5.00	4.50	

Rate BU	CE	CM	EA	EO	SW	UT
	1					
1	1				1	
1						1
6	15				5	1
3.00	7.50				5.00	1.00
				Overall Avg =		4.50

Tertiary

Utilization Rating	NMCB 1	NMCB 7	NMCB 7 4	NMCB 1 3	Total	% Hits
Total	1	2	0	0	3	
10		2			2	67%
9					0	0%
8					0	0%
7					0	0%
6					0	0%
5					0	0%
4					0	0%
3					0	0%
2					0	0%
1	1				1	33%
	1	20	0	0	21	
Avg	1.00	10.00	0.00	0.00	7.00	

Rate BU	CE	CM	EA	EO	SW	UT
1						1
				1		
10				1		10
10.00				1.00		10.00
				Overall Avg =		7.00

NEC 5915: Construction Planner & Estimator Specialist

Primary

Utilization Rating	NMCB 1	NMCB 7	NMCB 7 4	NMCB 1 3	Total	% Hits
Total	0	3	4	2	9	
10		1			1	11%
9		1			1	11%
8					0	0%
7				1	1	11%
6					0	0%
5			1	1	2	22%
4					0	0%
3					0	0%
2		1			1	11%
1			3		3	33%
Total	0	21	8	12	41	
Avg	0.00	7.00	2.00	6.00	4.56	

Rating	Rate BU	CE	CM	EA	EO	SW	UT
10	1						
9	1						
8							
7	1						
6							
5	1	1					
4							
3							
2		1					
1	3						
Total	34	7					
Avg	4.86	3.50					
					Overall Avg =		4.56

Secondary

Utilization Rating	NMCB 1	NMCB 7	NMCB 7 4	NMCB 1 3	Total	% Hits
	2	3	3	6	14	
10	1				1	7%
9					0	0%
8				2	2	14%
7		1			1	7%
6			1	1	2	14%
5	1		1	1	3	21%
4		1			1	7%
3					0	0%
2					0	0%
1		1	1	2	4	29%
	15	12	12	29	68	
Avg	7.50	4.00	4.00	4.83	4.86	

Rate BU	CE	CM	EA	EO	SW	UT
				1		
	1			1		
				1		
1				1		
1					2	
	1					
3					1	
14	12			31	11	
2.80	6.00			7.75	3.67	
				Overall Avg =		4.86

Tertiary

Utilization Rating	NMCB 1	NMCB 7	NMCB 7 4	NMCB 1 3	Total	% Hits
	0	0	0	1	1	
10					0	0%
9					0	0%
8					0	0%
7					0	0%
6					0	0%
5				1	1	100%
4					0	0%
3					0	0%
2					0	0%
1					0	0%
	0	0	0	5	5	
Avg	0.00	0.00	0.00	5.00	5.00	

Rate BU	CE	CM	EA	EO	SW	UT
						1
						5
						5.00
				Overall Avg =		5.00

NEC 6021: Safety Inspector

Primary

Utilization Rating	NMCB 1	NMCB 7	NMCB 4	MCB 3	Total	% Hits
Total	1	6	1	5	13	
10	1	2	1		4	31%
9					0	0%
8				2	2	15%
7		1		2	3	23%
6				1	1	8%
5					0	0%
4					0	0%
3		1			1	8%
2		1			1	8%
1		1			1	8%
Total	10	33	10	36	89	
Avg	10.00	5.50	10.00	7.20	6.85	

Rating	Rate BU	CE	CM	EA	EO	SW	UT
10					1	3	
9							
8						2	
7	2					1	
6							1
5							
4							
3					1		
2	1						
1							1
Total	16				13	53	7
Avg	3.20				6.50	7.57	3.54
					Overall Avg =		6.85

Secondary

Utilization Rating	NMCB 1	NMCB 7	NMCB 4	MCB 3	Total	% Hits
10					0	0%
9					0	0%
8					0	0%
7					0	0%
6					0	0%
5	1	1	1	1	4	100%
4					0	0%
3					0	0%
2					0	0%
1					0	0%
Avg	5	5	5	5	20	
	5.00	5.00	5.00	5.00	5.00	

Rate BU	CE	CM	EA	EO	SW	UT
2					1	1
10					5	5
5.00					5.00	5.00
				Overall Avg =		5.00

Tertiary

Utilization Rating	NMCB 1	NMCB 7	NMCB 4	MCB 3	Total	% Hits
	0	1	0	0	1	
10					0	0%
9					0	0%
8		1			1	100%
7					0	0%
6					0	0%
5					0	0%
4					0	0%
3					0	0%
2					0	0%
1					0	0%
Avg	0	8	0	0	8	
	0.00	8.00	0.00	0.00	8.00	

Rate BU	CE	CM	EA	EO	SW	UT
				1		
				8		
				8.00		
				Overall Avg =		8.00

NEC 9502: Instructor

Primary

		NMCB 1	NMCB 7	NMCB 4	NMCB 3	Total	% Hits
Total		0	1	0	0	1	
Utilization Rating	10					0	0%
	9					0	0%
	8					0	0%
	7					0	0%
	6					0	0%
	5		1			1	100%
	4					0	0%
	3					0	0%
	2					0	0%
	1					0	0%
	Total	0	5	0	0	5	
	Avg	0.00	1.00	0.00	0.00	5.00	

Rating	Rate BU	CE	CM	EA	EO	SW	UT
10							
9							
8							
7							
6							
5	1						
4							
3							
2							
1							
Total	5						
Avg	5.00						
					Overall Avg =		5.00

Secondary

	NMCB 1	NMCB 7	NMCB 4	NMCB 3	Total	% Hits
	2	4	2	1	9	
10					0	0%
9					0	0%
8					0	0%
7					0	0%
6	1				1	11%
5	1	2	1		4	44%
4				1	1	11%
3		1			1	11%
2		1			1	11%
1			1		1	11%
Avg	11	15	6	4	36	
	5.50	3.75	3.00	4.00	4.00	

Rate BU	CE	CM	EA	EO	SW	UT
1						
2		1				1
		1				
					1	
						1
1						
17		9			3	7
4.25		4.50			3.00	3.50
				Overall Avg =		4.00

Tertiary

	NMCB 1	NMCB 7	NMCB 4	NMCB 3	Total	% Hits
	3	4	2	4	13	
10				1	1	8%
9					0	0%
8			1		1	8%
7				1	1	8%
6					0	0%
5		1		1	2	15%
4		1			1	8%
3	1				1	8%
2					0	0%
1	2	2	1	1	6	46%
	5	11	9	23	48	
Avg	1.67	2.75	4.50	5.75	3.69	

Rate BU	CE	CM	EA	EO	SW	UT
				1		
				1		
					1	
	1			1		
	1					
				1		
1				3	1	1
1	9			29	8	1
1.00	4.50			4.14	4.00	1.00
				Overall Avg =		3.69

Appendix E

NEC Utilization Survey, Survey Results, and Thesis Summary

NEC SURVEY

Please complete the following survey to the best of your ability. Please answer all questions honestly and thoughtfully. The intent of this survey is to determine how the Naval Construction Force utilizes personnel with your particular skills and if management is adequately applying the knowledge pool and skills available in the best possible manner. Your responses will be compiled and analyzed to determine the exact picture of the Naval Construction Force's NEC skill capacity and how it is managed. The results will be forwarded to numerous commands involved in training and NEC management, and hopefully, will assist them in better managing the resources we possess. Therefore, once again, the honesty and thought put into your responses are critical. Thank you for your time and effort.

1. ***What is your rate?*** BU CE CM EA EO SW UT

   Response: Distribution consistent with normal NMCB manning

2. ***How much time do you have in the USN?*** 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 33

   Response: Average of 13.95 years

3. ***Have you cross-rated from a previous rate?*** Yes No

   Response: Average of 9%

4. ***How much time do you have in the NCF?*** 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23

   Response: Average of 12.29 years (considered inaccurate/poorly phrased question)

5. ***What is your current Battalion position?***_____

	Number	**Title**
6. ***What is your primary NEC?***	_____	_____
secondary NEC?	_____	_____
tertiary NEC?	_____	_____
other NEC (if applicable)?	_____	_____

Response: 58.26% related/41.74% not related (subjective opinion)

7. ***How many years were you in the NCF before receiving your first NEC bearing School?***_____

Second?_____

Third?_____

Response: First = 7.08 years, Second = 9.7 years, Third = 11.0 years, 4+ = 12.7 years

8. ***Was your NEC School an incentive by Detailers for your Re-Enlistment?*** Yes No

Response: 22.6% Yes/77.4% No

9. ***Were you sent to your first NEC school by:***

1) Detail shop during PCS orders? Yes No
2) Your Battalion while in homeport? Yes No
3) Your Battalion while on deployment? Yes No

Response: 56.52% BUPERS, 37.39% NMCB homeported, 2.61% NMCB deployed

second NEC school:

1) Detail shop during PCS orders? Yes No

2) Your Battalion while in homeport? Yes No

3) Your Battalion while on deployment? Yes No

Response: 58.14% BUPERS, 39.53% NMCB homeported, 2.33% NMCB deployed

third NEC school:

1) Detail shop during PCS orders? Yes No

2) Your Battalion while in homeport? Yes No

3) Your Battalion while on deployment? Yes No

Response: 42.22% BUPERS, 46.67% NMCB homeported, 11.11% NMCB deployed

10. ***Were you detailed to your present assignment to fill a NEC vacancy?***

Yes No Do Not Know

Response: % Yes = 28.65, % No = 46.05, % Did Not Know = 25.3%

11. ***On a scale of 1 to 10, how effectively do you feel the NCF has utilized your Primary NEC related talents?*** 1 2 3 4 5 6 7 8 9 10

Secondary? 1 2 3 4 5 6 7 8 9 10

Tertiary? 1 2 3 4 5 6 7 8 9 10

Response: Primary = 6.71, Secondary = 4.95, Tertiary = 4.63

12. ***Have you ever been given a Battalion assignment as a direct result of any of your NECs?*** Yes No ***If Yes, what position was it?***_____

Response: Yes = 45.49%, No = 54.51%

13. ***Have you ever filled a Battalion position that was not related to any of your NECs?*** Yes No ***If Yes, what position was it?***_____

Response: Yes = 41.90%, No = 58.10%

14. ***On a scale of 1 to 10, does your current position maximize your NEC related skills?***

Primary 1 2 3 4 5 6 7 8 9 10

Secondary 1 2 3 4 5 6 7 8 9 10

Tertiary 1 2 3 4 5 6 7 8 9 10

Response: Primary = 5.35, Secondary = 4.19, Tertiary = 3.4

15. ***On a scale of 1 to 10, how effectively do you feel your NEC school prepared you technically for project supervisory type positions?*** 1 2 3 4 5 6 7 8 9 10

Response: 7.2

16. ***On a scale of 1 to 10, how effectively do you feel your NEC school prepared you managerially for project supervisory type positions?*** 1 2 3 4 5 6 7 8 9 10

Response: 6.57

17. ***Do you feel management has given assignments without regard to yours or others NEC?*** Yes No

Response: %Yes = 61.74, %No = 38.26

18. ***Do you feel management studies or considers NEC skills prior to making position assignments?*** Yes No

Response: %Yes = 39.37, % No = 60.63%

19. ***In general, do you feel the NCF manages an effective NEC training and utilization program that maximizes available resources?*** Yes No

Response: %Yes = 37.16, %No = 62.84

20. ***Did you feel a sense of competition for selection to attend a NEC school?*** Yes No

Response: %Yes = 45.41%. %No = 54.59

21. ***What do you feel was the primary consideration for selection?***

Ability	Past Performance	Chain of Command Support
Evals	Motivation	Favoritism
S7/S3 Random Selection		Politics

Response: Ability = 17.65%, Evaluations = 6.93%, Performance = 24.85%, Chain of Command support = 11.58%, Motivation = 10.35%, Politics = 11.63%, Favoritism = 7.5%, S7/S3 Random selection = 9.33%

22. ***Have you ever felt you were more qualified or professionally adept than others selected for a NEC school you were interested in?*** Yes No

Response: %Yes = 36.12, %No = 63.88%

23. ***Have you even sensed favoritism as a primary reason on behalf of upper management for selection to attend a NEC school?*** Yes No

Response: %Yes = 31.77%, %No = 68.23%

24. ***During your last shore assignment, was your detailing a result of your NEC, or did you have freedom to select your shore assignment?*** NEC Personal Choice

Response: %NEC = 15.41, %Personal Choice = 84.59

25. ***Have you applied your NEC skills while on shore assignment?*** Often Rarely

Response: %Rarely = 44.58, %Often = 55.42

26. ***Did you know certain NECs such as Safety Inspector and Construction Inspector are currently overtrained at 538% and 316%, respectively?*** Yes No

To what would you attribute these inflated numbers?_____

_____

Response: %Yes = 7.68, %No = 92.32

27. ***Did you know that despite having 323 NEC Safety Inspectors in the NCF, we only have 60 total billets and only 38 NEC holders are actually filling a billet?***

Yes No

To what would you attribute these inflated numbers?_____

_____

Response: %Yes = 4.43, %No = 95.57

28. ***Please provide any additional thoughts or comments you have personally regarding the NEC program in general or recommendations for change/improvement you may have***

Thank you for your time and assistance.

Current East Coast NMCB NEC Attainment and Manning Levels (Chapter Four)

NEC	Title	Cumulative Attainment	Actual Strength
5503	Adv Engineering Aid	187.50%	187.50%
5635	Adv Construction Electrician	162.50%	170.80%
5644	Cable Splicing	208.30%	267.00%
5707	Water Well	120.00%	155.00%
5708	Blaster	156.30%	181.30%
5710	Adv Equipment Operator	196.70%	209.40%
5805	Adv Construction Mechanic	310.00%	310.00%
5907	Adv Builder	193.80%	208.30%
5908	Tool & Equipment Technician	187.50%	262.50%
6010	Adv Steelworker	231.30%	268.80%
6104	Shore AC&R Technician	162.50%	170.80%
6105	Adv Utilitiesman	118.80%	125.00%
5501	Construction Inspector	345.80%	354.20%
5915	Planner & Estimator	196.40%	214.30%
6021	Safety Inspector	1012.50%	1012.50%
9502	Instructor	162.50%	170.80%
	Avg	**247.03%**	**266.76%**

NEC School Funding Requirements (Chapter 4)

Average NEC Skill Cost = $8,500

Average E6 NEC Holder Training Cost = $17,000+

Current E6 NEC Resource Pool Cost = $30,600,000

Overall NEC Utilization Survey Results (Chapter Six)

NEC	Title	NEC			
		Primary	Secondary	Tertiary	Avg
5503	Adv Engineering Aid	10.00	10.00	N/A	10.00
5805	Adv Construction Mechanic	6.79	N/A	N/A	6.79
6021	Safety Inspector	6.85	5.00	8.00	6.62
5710	Adv Equipment Operator	7.38	5.80	N/A	6.59
5501	Construction Inspector	6.43	4.50	7.00	5.98
6010	Adv Steelworker	5.17	2.75	10.00	5.97
5635	Adv Construction Electrician	6.00	6.50	3.50	5.33
5915	Planner & Estimator	4.56	4.86	5.00	4.81
6105	Adv Utilitiesman	5.67	6.00	1.50	4.39
9502	Instructor	5.00	4.00	3.69	4.23
6104	Shore AC&R Technician	5.00	4.60	1.00	3.53
5907	Adv Builder	3.27	5.75	1.00	3.34
5708	Blaster	4.00	2.75	N/A	3.38
5644	Cable Splicing	4.00	2.00	N/A	3.00
5707	Water Well	1.50	4.40	2.00	2.63
5908	Tool & Equipment Technician	3.00	3.00	1.00	2.33

Alternate Management Practices and Formats (Chapter 7)

1. Upper Management Education

   \+ Increased CEC Officer knowledge and NEC program management capacity

   \+ More effective placement and use of NEC resources

   \- None noted

   Implementation: Uncomplicated/Low Cost/Short Timeframe (CECOS)

   Recommendation: Implement immediately

2. Restrict OF-13 Personnel to Two NCF Related NECs

    + More equal dispersion of NEC talent and increased overall assignment flexibility
    + Increased utilization of NECs held
    + Increased skill proficiency through more frequent skill practice
    - Reduction of individual NEC Holder assignment flexibility
    - Negative attitude in current Enlisted Community (resistance to change)
    - Decrease in individual diversity

    Implementation: Uncomplicated/Low Cost/Short Timeframe (NAVFAC or Brigade Instruction)

    Recommendation: Implement after concurrence from appropriate personnel responsible for policy formulation

3. Creation of NMCB NEC Special Staffs

    + Full and complete utilization of NEC training
    + Development of NEC "experts" through continuous NEC skill use
    + Reduction of training and funding requirements
    + Elimination of "learning curves" or periods of initial ineffectiveness
    - Staff assignments reduce "hands on" practical construction craft skills
    - NEC holders become less "well rounded" and more "focused"; thereby decreasing NMCB management and assignment flexibility
    - Staff is fixed in capacity and may be unable to rapidly respond to a sudden increase in workload or responsibility if required

    Implementation: Uncomplicated/Low Cost/Short Timeframe (NAVFAC or Brigade Instruction)

    Recommendation: Implement only if funding or resource restrictions mandate

4. Revision of Brigade Tasking Assignments to Battalions

+ Increased NEC utilization and exposure through more diverse projects requiring a wider NEC spectrum

- None noted

Implementation: Uncomplicated/Low Cost/Short Timeframe (Brigade Methodology)

Recommendation: Implement if or when theater tasking allows

5. Detailer Management of NEC Position Assignments

+ Full and complete utilization of the NEC skill for which the individual NEC Holder was Detailed

+ Full and complete utilization of NEC training

+ Development of NEC "experts" through continuous NEC skill use

+ Reduction of training and funding requirements

+ Elimination of "learning curves" or periods of initial ineffectiveness (Identical to option 3)

- Decreased NMCB assignment flexibility and no ability to remove sub-standard or ineffective performers

- Decreased E6 career exposure and reduced career and skill developmental opportunities

- Potential tours unrelated to NECs held (Training, Career Counseling, etc.)

- A much more complex process the BUPERS Staff is currently not designed to manage

Implementation: Complicated/High Cost/Extended Timeframe (BUPERS Methodology)

Recommendation: Currently not feasible or recommended

6. NCF Reserve Tasking

+ Reduction of NMCB and Detailer active duty NEC managerial requirements
+ Specialized NEC Staff activation in whole or part as required
+ Greater capitalization of civilian skills comparable to NEC
- Civilian occupation may be unrelated to NEC held
- Difficulties associated with Reserve activation and re-assimilation period required upon return to Active Duty
- Integration process with Active counterparts

Implementation: Complicated/Higher Cost (administrative)/Extended Timeframe

Recommendation: Currently not recommended

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4. Chief, Naval Education and Training (CNET) report " Planning Data Sheet for NEC School Requirements" dated 29 October, 1996

5. Commander, Enlisted Personnel Management Command (EPMAC) report "POB09 NEC Requirements by NEC" dated 19 October, 1996

Vita

Steven John McGrey was born in Milwaukee, Wisconsin on January 11, 1967 as the son of Michael E. McGrey and Barbara L. Zantow McGrey. After spending formative years in Galveston Bay, Texas and Redlands, California, he graduated from Riverside High School in Greenville, South Carolina in 1984. From 1984 to 1988, he attended Virginia Polytechnic Institute and State University (VPI) and was a member of the Virginia Tech Corps of Cadets, Naval Reserve Officers Training Corps (NROTC), Pi Kappa Phi Fraternity, and the Order of Omega Greek Leadership Society. Upon graduation in May, 1988 and receipt of a Bachelor of Science in Mechanical Engineering (BSME), he was commissioned as an Ensign in the Civil Engineering Corps (CEC) of the United States Navy.

Tours of duty and work experience include Assistant Public Works Officer, Naval Air Station, Cecil Field, Florida; Staff Civil Engineer, U.S. Naval Supply Depot, Subic Bay, Republic of the Philippines, Assistant Officer in Charge of Construction, Naval Station Panama Canal, Republic of Panama, and a variety of assignments in Guam, Spain, Tunisia, and Greece while assigned to U.S. Naval Mobile Construction Battalion ONE.

Currently a Lieutenant in the U.S. Navy Civil Engineering Corps, he began the Masters Program in Construction Engineering and Project Management in Fall 1996 as a normal tour of CEC duty. Upon completion in August, 1997, he will resume his career in the Civil Engineering Corps.

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